



**National Aeronautics and
Space Administration**

October 15, 2002

CAN-02-OES-02

A COOPERATIVE AGREEMENT NOTICE

Inspiring the Next Generation of Explorers
The GLOBE Program

Area 1: Worldwide Implementation Organization
Area 2: United States Country Coordinator

Proposals Due January 15, 2003 by 4:30 p.m. (EST)

OMB Approval No. 2700-0087

Inspiring the Next Generation of Explorers:

The GLOBE Program

Area 1: Worldwide Implementation Organization

Area 2: United State Country Coordinator

A Cooperative Agreement Notice for the Office of Earth Science

CAN 02-OES-02

Issued October 15, 2002

Proposals due January 15, 2003

Selection(s) announced March 1, 2003

**Office of Earth Science
National Aeronautics and Space Administration
Washington, DC 20546**

Foreword

The NASA's vision is

To improve life here,
To extend life to there,
To find life beyond.

The NASA mission is

To understand and protect our home planet
To explore the universe and search for life
To inspire the next generation of explorers
....as only NASA can.

NASA's Earth Science Enterprise (ESE) supports the Agency mission through scientific research that increases our understanding of and our capability to model and predict the Earth system, and through applications that expand and accelerate the realization of economic and societal benefits from Earth science, information, and technology. The ESE also supports NASA's mission in "*inspiring the next generation of explorers...as only NASA can*" by aligning with the Agency's priorities in education:

- Motivate K-16+ students to pursue careers in science, mathematics and engineering;
- Provide educators with unique teaching tools and compelling teaching experiences;
- Seek to ensure that we are investing the taxpayer's resources wisely; and,
- Engage minority and underrepresented students, educators, and researchers in NASA's education program.

The GLOBE Program (www.globe.gov) has been an exciting, worldwide, hands-on, primary and secondary school-based education and science program. Through this Cooperative Agreement Notice (CAN), the Office of Earth Science seeks partners for continued operation and enhancement of GLOBE so that it contributes to NASA's new education initiative in K-12 math and science education. The desired outcomes of this new education initiative are:

1. Increasing student interest and participation in science, technology, engineering and mathematics programs.
2. Increasing student knowledge and interest about careers avenues in science, technology, engineering and mathematics.
3. Increasing student ability to apply science, technology, engineering, mathematics and geography.
4. Increasing the active participation and professional growth of educators in science, mathematics, geography, and technology resulting in higher quality education and achievement for K-12 students.

5. Increasing the "on-line" access and utilization of NASA information as examples of authentic application of science, technology, engineering and mathematics in the classroom while enhancing their access to NASA scientists, engineers and other unique personnel.

The NASA Office of Earth Science also recognizes the scientific value of the environmental observations made by the students and teachers of GLOBE schools in not only student investigations, but also Earth science research and applications. Through this CAN, the Office of Earth Science also expects the GLOBE Program to become an active member of the Earth Science Research, Education and Applications Solutions Network (REASoN) – a distributed network of data and information providers – to facilitate greater use of GLOBE data in research and applications projects.

Detailed descriptions of this opportunity are contained herein. Your interest and cooperation in participating in this opportunity are appreciated.

ORIGINAL SIGNED BY

Ghassem R. Asrar
Associate Administrator for Earth Science

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NASA Cooperative Agreement Notice: The GLOBE Program

I. Summary of Solicitation

NASA is soliciting proposals through this Cooperative Agreement Notice (CAN) from organizations or consortia to assume implementation responsibility for either (or both) of the GLOBE program areas (designated below as Area 1 and Area 2). The objective of this solicitation is to continue, enhance, and expand on the legacy of the GLOBE program in both of these areas and to further NASA's objectives in education. (The current GLOBE program is described in Appendix A.)

Area 1 - GLOBE Worldwide Implementation

Area 1 involves sustaining and improving approaches and infrastructure to enable K-12 students around the world to contribute research quality data to the study of the Earth in concert with NASA's Earth Science Enterprise. This area includes responsibility for coordinating the efforts of GLOBE partner countries (listed in the Appendix and as background information on the GLOBE Website www.globe.gov) to implement GLOBE in their schools and youth organizations.

Area 2 – GLOBE US Country Coordinator

Area 2 includes the overall responsibility for program implementation in the United States, including continuation, modification, and expansion of partnerships with organizations that implement GLOBE within the United States.

All proposing organizations must provide for the continuation, growth, and enhancement of the GLOBE Program and for the achievement of NASA's objectives in K-12 math and science education. Academic institutions, educational organizations, private not-for-profit, private for-profit, government organizations¹, or any consortium of these types of organizations may propose.

II. NASA's Overall Purpose, Approach, and Expectations for the GLOBE Program

Purpose

The purpose and mission of the GLOBE program is to improve student achievement in science and mathematics and enable student involvement in providing research-quality environmental observations that would otherwise be unavailable to the Earth science community. GLOBE serves NASA's vision to "*improve life here*" on Earth and supports NASA's mission foci "*to understand and protect the home planet*" and to "*inspire the next generation of explorers*".

¹ Should **another agency** of the US Government be selected under this notice, NASA would enter into an inter-agency agreement with that **agency**.

GLOBE contributes to NASA's new education initiative in K-12 math and science education. The desired outcomes of this new NASA education initiative are:

1. Increasing student interest and participation in math, science, technology and geography;
2. Increasing student knowledge about career avenues in science, math, engineering, and technology;
3. Increasing student ability to apply math, science, technology, and geography;
4. Increasing active participation and professional growth of educators in science, math, geography, and technology resulting in higher quality education for K-12 students; and
5. Increasing the on-line access and utilization of NASA information as applied science math, geography and technology in the classroom.

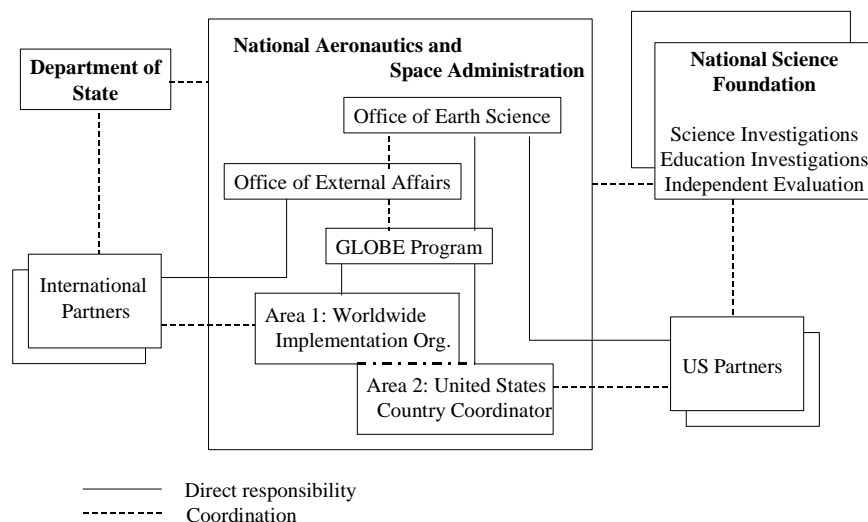
GLOBE serves the NASA Earth Science Enterprise by providing a path for student involvement with Earth science research and development of aerospace science and technology missions. Through partnerships among educators, students, teachers, and scientists, GLOBE provides a venue for introducing data from Earth science research and satellite observations for use in the classroom.

NASA has assumed responsibility as lead agency for the GLOBE Program from NOAA. NASA holds the international agreements through which other countries partner in the Program. NASA administers and oversees the worldwide partnership of scientists, students, and teachers along with the activities and infrastructure that enable GLOBE's partners to support teachers in their classroom implementation of the Program.

NASA partners with the National Science Foundation (NSF) in the GLOBE program. NSF provides oversight and management of competitively selected GLOBE science and education investigations. NSF provides funding of these investigations for US institutions and accepts co-funding from any other science program that elects to provide support.

The environment in which GLOBE operates is depicted in Figure 1.

Figure 1. GLOBE Environment



Approach

GLOBE's approach is to employ a public-private partnership through a program with national and international partners committed to accomplishing the purpose stated above.

Through this Cooperative Agreement Notice (CAN) , NASA will select one or two organizations to take responsibility for GLOBE program implementation, including support for meeting the US Government's commitments under agreements with international partners. Proposals are to be due within 92 days of announcement, with plans to select one or two successful offerors to be announced in the March 2003 time frame. Through this CAN, NASA will offer total funding of up to \$5 million per year for five years with possible continued support for up to 5 additional years, pending availability of funds and satisfactory performance. Any funding past the initial five-year period will be based on a rigorous review; a re-competition may be required. The objective is for the GLOBE program to be self-sufficient within 10 years of the initiation of agreement(s) under this solicitation.

Pursuant to selection, a transition of operational responsibility from the current NASA GLOBE office, help desk, support organizations, and systems groups will begin. The NASA GLOBE Program Office (GPO) plans for the transition to be completed no later than September 2003. Funding under this solicitation will support selected offerors in accomplishing the transition. NASA will provide for the continuation of current GLOBE activities until the selected offerors assume their responsibilities under the transition plan. To help ensure the continued success of the Program during the competition and transition, NASA plans to support the GLOBE staff and the GLOBE help desk, systems groups, existing cooperators, and contractors through the end of FY2003 (September 30, 2003).

Overall Expectations

1. GLOBE will continue to operate successfully to achieve its stated purpose and mission (see page 7) and to contribute to NASA's overall education program.
2. GLOBE will enhance its contribution to NASA's objectives in K-12 math and science education, including being an active member of the Earth Science Research, Education and Applications Solutions Network (REASoN, http://research.hq.nasa.gov/code_y/open.cfm)
3. The competitive selection through the Cooperative Agreement Notice will yield the best available solution for the government to benefit from the value of the GLOBE program.
4. NASA will successfully coordinate the competition, selection, and transition with all parties associated with the GLOBE Program.

Expectations for maintaining performance of the GLOBE Program:

- Continued support for U.S. teacher implementation of GLOBE (with recruiting, training, and follow-up) working in partnership with other self-supporting US organizations
- Maintain support and interfaces to international GLOBE partner countries including fulfilling the commitments under the international GLOBE agreements
- Maintain means to ingest, quality control, archive, and provide access to all GLOBE data using the Web and Internet
- Provide appropriate visualizations of GLOBE data
- Communicate GLOBE news and accomplishments with program participants, the science and education communities, program sponsors, and the general public
- Provide web-based means for communication among program participants (scientists, teachers and students), for coordination of GLOBE Partner activities, and for publication of student research results
- Work with the larger scientific community on special measurements, non-US science investigations, and involvement of GLOBE schools and students in other projects
- Work with the larger education community to support GLOBE inclusion in educational materials, curricula, and programs
- Develop and publish educational materials that are scientifically accurate and ready to be used in classroom environments
- Expand diversity represented in US GLOBE participation (partners, schools, students, teachers, trainers)
- Effectively manage GLOBE and coordinate among all program partners and participants, including maintaining a database of GLOBE teachers and trainers, a calendar of trainings and events, and tracking of metrics of GLOBE's progress

Planned 5-year Program Growth:

International

- Support for increasing number and activity of international partners
- Support for international partners' commitments to being adopted nationwide
- Support ties to missions of international partner countries

US

- Support for increasing number and activity of US partners
- Alignment of GLOBE to standards of learning in at least 10 states
- Five more statewide adoptions of GLOBE for incorporation in classroom plans
- Incorporation of GLOBE in pre-service teacher education programs in at least 5 more states
- Pre-test/post-test assessment of GLOBE's effects on at least 1000 students in at least 3 grades
- Establishing GLOBE ties to all appropriate NASA Earth science missions through their respective education and outreach efforts

- Expanded use of GLOBE data to include data integration into scientific modeling, additional research investigations, overall observational systems, and decision support tools
- Expanded use of GLOBE data by schools and students to include use in inquiry based student investigations

Materials

- Completing publication of at least two textbooks (in progress) that include GLOBE content
- Significant development of classroom-ready materials that are identified as top priorities by US program participants
- Improved adaptation of GLOBE web-based materials for classroom use
- Significant development of classroom-ready materials that bring the results of NASA programs to students for use in the study of science, math, geography, and technology

Outputs

- >3000 Schools reporting data per year (defined as August 1 – July 31)
- >800 Atmosphere sites (temperature, precipitation, clouds) report each weekday (on average)
- >3000 Students on Honor Rolls achieved each year by GLOBE schools
- >100 Student journal reports per year
- At least 3 Metrics defined and determined for the use and benefit of GLOBE in education (other than data reporting)
- At least 1 Metric defined and determined of the effect of GLOBE on US teacher retention and professional growth

III. Description of the Opportunity

GLOBE is an on-going program enabling students around the world to take measurements of the Earth system and report the resulting research-quality environmental data through a structured partnership program involving educators, teachers, students, and scientists. Students involved in the GLOBE Program benefit from improved achievement in science, math, geography, and technology. The students also benefit from interaction with members of the research community who use data collected by students in locations around the world - data that generally would not be available except through the efforts of volunteer schools and youth organizations located around the world.

At present, the US Government has partnership agreements with 99 countries for implementation of GLOBE. GLOBE requires that participating schools have at least one teacher trained in the measurement protocols. To date, over 21,000 teachers from more than 12,000 schools have received such training. GLOBE students have reported data from more than 8 million individual measurements.

For each type of GLOBE measurement to be made by the students, there is a protocol provided by GLOBE that specifies how students are to conduct their observations. The instruments to be used in the measurements are also specified. Science investigations associated with the GLOBE program take responsibility for

- establishing the protocols and instrument specifications,
- reviewing all student data for quality, and
- using some of the data acquired through the GLOBE program in their published research.

Each of the science investigation teams is committed to work in partnership with students and teachers trained in GLOBE.

GLOBE benefits from collaborative efforts with the National Science Foundation (NSF). NSF competitively selects and funds a set of US science investigations that support each of the Basic, Advanced, and Optional GLOBE measurement protocols². In addition to these measurements, the protocols have been extended through specific agreements with other research groups that desire student observations for use in their research and are willing to fulfill the duties of GLOBE science investigations (beyond the scope of specific funding from NSF). Their measurements are known as "Special" GLOBE measurement protocols.

In addition, the NSF selects and funds a set of education investigations. One of the specially funded activities is an independent program evaluation for GLOBE. The education investigations are typically projects that contribute to the educational materials of GLOBE and projects that support GLOBE implementation.

GLOBE has agreements with other federal, state, and local government and non-profit organizations. These partnerships provide for recruiting, training, and continuing support of US teachers. In the past, GLOBE also directly trained US teachers, and consequently, there are several thousand teachers that only have an affiliation with the GLOBE program, but not with any of the current portfolio of GLOBE partners.

Area 1 offerors should propose to continue and improve worldwide GLOBE implementation in both quality and quantity, to continue support for all GLOBE measurement protocols specified in this CAN, to fulfill the US Government's obligations under its international agreements and to provide similar support for implementation in the United States. Support for measurements includes:

- Ingest, archival, and timely distribution of all data acquired following these protocols,
- Visualization of all appropriate student data,
- Provision through both print and electronic means of the written protocol, instrument specifications and associated instructions, and answers to questions regarding the measurements, and

² Basic and Advanced measurement protocols are those for which GLOBE offers training to the trainers of its partners. Optional protocols include: (1) alternative methods for taking data that are normally taken following Basic or Advanced protocols; (2) measurements that can only be accomplished using automated equipment; and (3) measurements that cannot be accommodated routinely in GLOBE train-the-trainer workshops.

- Training for trainers of teachers or direct training of teachers in those protocols that are not designated as optional or special measurements.

Working with the science investigation teams, the organization selected in Area 1 will be free to improve, augment, or correct as needed the statement of the protocols, the way in which they are trained, and all materials provided in support of classroom implementation of GLOBE. This includes the ways in which data are submitted to the GLOBE archive, visualized, and provided to both professional and student users of these data.

Area 2 offerors should propose to continue and improve GLOBE implementation in US schools and youth organizations. This includes provision of the hands-on training in GLOBE measurement protocols for US teachers and/or trainers of teachers. Area 2 offerors are also encouraged to facilitate the development of educator teams and student investigations in support of NASA objectives in K-12 math, science, and geography education. All partnership agreements with organizations in the US for the recruitment, training, and support of teacher implementation of GLOBE will be transferred to the selected Area 2 organization selected for continuation, modification, and expansion.

NASA will select no more than one proposal for each of the areas given above and may select the same organization to perform both functions. Following selection, NASA will provide to the selected organization(s) funds for a transition period beginning with selection and continuing through September 30, 2003. Beyond the transition period, the initial award is expected to be for five (5) years. Based on the current configuration of national and international partnerships, roughly 70% of GLOBE funds are invested in the functions included in Area 1 and roughly 30% of current funds go to the functions included in Area 2. The respective allocation of funds between Areas 1 and 2 may vary as a result of this competitive selection depending on the proposed configuration of national and/or international partnerships as well as the merit of the proposal(s) in meeting NASA objectives for the GLOBE Program.

The award may be renewed for up to five (5) additional years. Renewal reviews in the third (3rd), fifth (5th), and seventh (7th) years will determine the continuation of funding. Should NASA not choose to renew the award, the Agency will determine the best means to continue support for GLOBE and work with all participants to achieve an orderly transition in the way GLOBE is supported. Both Area 1 and Area 2 awardees are expected to be self-sufficient after ten (10) years, and the level of support and continuation of support during the renewal period will take into account progress toward self-sufficiency.

The Government's obligation to make awards is contingent upon the availability of appropriated funds from which payment can be made.

IV. Roles, Responsibilities and Expectations of the Government, the Area 1 and the Area 2 GLOBE Organizations

Under the agreement(s) resulting from this solicitation, NSF will continue to provide science and education investigations funded at US institutions. The US Government will remain responsible for the selection of all GLOBE measurements. NASA, working with the US Department of State, will remain responsible for negotiating, concluding, and holding agreements with international partners in GLOBE. NASA will provide coordination of the overall GLOBE Program including interface with the selected organization(s) and review of performance under the agreements that result from this CAN.

A summary of roles and responsibilities is given in the following table.

The US Government	Area 1 GLOBE Organization	Area 2 US GLOBE Country Coordinator
<p>Negotiate and hold all international GLOBE Agreements by means of which countries join the Program (NASA with US Department of State)</p> <p>Selection of all Science Measurement Protocols for inclusion in GLOBE (NASA)</p> <p>Funding of at least one research investigation from a US institution to support every Basic, Advanced, and Optional (as opposed to Special) GLOBE measurement protocol (NSF)</p> <p>Publication in the refereed scientific literature of research that includes use of GLOBE student data and inclusion of GLOBE data in databases used by the professional Earth science and applications communities</p> <p>Provision of a GLOBE Program Director to:</p>	<p>Fulfill all US Government obligations under the international GLOBE Agreements</p> <ul style="list-style-type: none"> Work with all GLOBE Country Coordinators (including Area 2 US Country Coordinator) to support their GLOBE implementation Provide Protocols, Instrument Specifications, data entry and distribution, and other essential supporting materials in the six (6) UN languages <p>Support all selected Science Measurement Protocols including:</p> <ul style="list-style-type: none"> Detailed description of Protocols and Instrument Specifications Communication to GLOBE participants 	<p>Oversee, coordinate, encourage, and support implementation of GLOBE in the United States with emphasis on grades K – 12</p> <p>Ensure that implementation of GLOBE in the US includes following the GLOBE protocols and use of instruments that meet specifications</p> <p>Provide for the training of US teachers in GLOBE including the continuation and growth as needed of a set of certified GLOBE teacher trainers</p> <p>Provide to the Worldwide GLOBE implementation organization (Area 1) routine and periodic information on US implementation</p> <p>Work to achieve permanent incorporation of GLOBE in school and youth organization programs across the country</p> <p>Provide outreach to the public,</p>

<ul style="list-style-type: none"> • Coordinate Government activities with those of the Area 1 & 2 organizations • Manage the selection, award, review, and renewal of the Area 1 & 2 organizations • Participate with all involved in GLOBE in the strategic planning, policy development, and advocacy for this Program <p>Provision of an annual independent program evaluation (NSF)</p> <p>Provision, from time to time, of additional education investigations associated with and supportive of GLOBE (NSF, others)</p> <p>Guidance on standards, interoperability, and requirements for being an active member of Earth Science REASoN</p> <p>Facilitate US GLOBE Schools to collaborate with NASA's new education initiative in K-12 math, science, and geography education</p> <p>Interface to science and Earth science application programs and specialists</p> <p>Access to NASA results in the form of data, models, and visualizations</p>	<p>and data users</p> <ul style="list-style-type: none"> • Provision for hands-on training of teachers • Development and provision of material to support classroom implementation of GLOBE measurements • Ingest, archival, and distribution of the resulting data • Data visualization <p>Facilitate the worldwide partnership among students, teachers, and scientists that is GLOBE</p> <p>Provide outreach to the public, the press, and potential participants</p> <p>Recognize individual, group, and school achievement in GLOBE through the Chief Scientist's Honor Roll, student research journal, and other means</p> <p>Maintain the worldwide registry of all participating schools, trained teachers, teacher trainers, and master trainers (trainer trainers)</p> <p>Cooperate and/or collaborate as an active member of Earth Science REASoN</p> <p>Cooperate in the annual independent program evaluation</p> <p>Place the GLOBE worldwide coordination and support activities on a self-sustaining basis within 10 years</p>	<p>the press, state and local education organizations, youth groups, and potential participants in the US</p> <p>Cooperate in the annual independent program evaluation</p> <p>Place GLOBE in the US on a self-sustaining basis within 10 years</p> <p>Coordinate with NASA Education program office for K-12 math, science, and geography education to facilitate educator team development and support student investigations</p>
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Area 1 Expectations:

Program Maintenance

- Support and liaison to GLOBE Partner Countries including fulfilling the commitments under NASA's international GLOBE agreements
- Means to ingest, quality control, archive, and make available all GLOBE data using the Web and Internet
- Communication of GLOBE news and accomplishments with program participants, the science and education communities, program sponsors, and the general public
- Development and publication of educational materials that are scientifically accurate and classroom ready
- Effective management of GLOBE and coordination among all Program Partners and participants, including a database of GLOBE schools, teachers, trainers and master trainers, a calendar of trainings and events, and tracking of metrics of GLOBE's progress

5-year Program Growth

Partner Activities

- Support increasingly active country partners
- Support accommodation of at least 3 additional countries each year
- Support for international partners' commitments to nationwide curriculum adoptions
- Establish ties to key international partner research missions
- Establish ties to all appropriate³³ NASA missions' education and outreach efforts

Materials

- At least two textbooks nearing publication that include GLOBE
- Increased use of GLOBE data by schools and other users
- Improved adaptation of GLOBE Web-based materials for classroom use
- Significant development of classroom-ready materials that are identified as top priorities
- Significant development of classroom-ready materials that bring the results of NASA programs to students for use in the study of science, math, geography, and technology

Outputs

- >3000 Schools reporting data per year (August 1 – July 31)
- >800 Atmosphere sites (T, relative humidity, precipitation, and cloud data) report each weekday (on average)
- >3000 Chief Scientist Honor Rolls achieved each year by GLOBE schools
- >200 Student journal reports each year
- At least 3 Metrics defined and determined for the use and benefit of GLOBE in education other than data reporting

³ Appropriate missions are ones where student data can contribute to the mission in some way.

Area 2 Expectations:

Program Maintenance

- Support for US teacher and youth organization implementation of GLOBE with recruiting, training, and follow-up
- Effective means for communication among US program participants (teachers, students, etc.)
- Work with the larger US scientific community on involvement of GLOBE schools and students in local and regional projects that use student data
- Work with the US education community to support GLOBE inclusion in educational materials, curricula, and programs
- Diversity represented in GLOBE participation (partners, schools, students, teachers, trainers)

5-year Program Growth

Activities and Materials

- Support increasingly active US implementation
- Alignment of GLOBE to standards of learning in 10 states
- Five more adoptions of GLOBE for statewide classroom implementation (beyond North Carolina and Texas) or for inclusion in the programs of regional or national youth groups
- Five more pre-service teacher education programs incorporating GLOBE (each in a different state)
- Establish ties to all appropriate³ NASA missions' US education and outreach efforts
- Support for classroom use of materials that bring the results of NASA programs to US students for use in the study of science, math, geography, and technology
- Support for enhanced understanding by US students of the career avenues for science, math, geography, and engineering

Outputs

- >1500 US Schools reporting data per year (defined as August 1 – July 31)
- >400 US Atmosphere sites (temperature, relative humidity, precipitation, and cloud protocols) report each weekday (on average)
- >1500 Chief Scientist Honor Rolls achieved each year by US GLOBE schools
- >100 US Student journal reports per year
- At least 1 Metric defined and determined of the effect of GLOBE on US teacher retention and professional growth
- 1000 students Pre-test/post-test assessment of GLOBE's effects on US students in 1 to 3 grades

More detailed descriptions of the current GLOBE Program, definitions of key terms as used in connection with GLOBE, the Measurement Protocols and levels of support, current GLOBE Science and Education Investigation Teams, as well as the International and US Partner Agreements may be found in Appendices A-F.

To obtain further information, all offerors are encouraged to extensively browse the GLOBE Website <http://www.globe.gov/>. Data entry and GLOBEMail are the only aspects of the Website that are password protected. Offerors without current GLOBE IDs and passwords may obtain ones for use in reviewing the Website by requesting them in an e-mail to CAN@globe.gov. Extensive background information about GLOBE is available to offerors by clicking on the <CAN> link on the GLOBE homepage.

Offerors may wish to send representatives to attend a GLOBE Train-the-trainer workshop. Attendance can be arranged by request in an e-mail to CAN@globe.gov.

V. Guidelines on Proposal Format and Content

In addition to the general instructions for responding to a NASA Cooperative Agreement Notice (Appendix G), the following guidelines on the format and content of the proposal should be followed:

Format

The proposals for both Area 1 and Area 2 shall begin with a cover sheet (Appendix H) that includes official signatures committing all proposing organizations and a table of contents. The body of the proposal shall contain the following sections:

1. Introduction describing the proposing organization or organizations, their governing structures, goals and objectives, and their specific intentions in proposing in response to this CAN;
2. 5-Year Plan for GLOBE operations from October 1, 2003 through September 30, 2008, including detailed descriptions of how the various activities will be conducted and how the specific responsibilities will be accomplished;
3. Transition Plan for how the organization will take over responsibilities currently implemented by the GLOBE Office and its support groups during the 6 or 7 months between award of the cooperative agreement and September 30, 2003;
4. Description of existing resources of the organization or organizations that will be contributed to this effort, financial contributions, and plans for placing GLOBE on a self-sustaining basis within 10 years including any development efforts (resource sharing is required for all for-profit private organizations that are expected to receive compensating benefits through the development or enhancement of a product or service that may result from their work funded by NASA);
5. Detailed personnel, budget, and financial plans for the transition period and each of the following five (5) years except for offers from institutions outside the United States.

The body of proposals for Area 1 should not exceed fifty (50) pages in length, and the body of proposals for Area 2 should not exceed thirty-five (35) pages in length. Background information such as resumes of team members, descriptions of the organization(s), and examples of previous work specifically relevant to GLOBE implementation may be provided in addition as appendices. The typeface used throughout the text of the proposal may not be smaller than 12

point and all pages are to have at least 1" margins. If the offeror is proposing for both Areas 1 and 2, the limit on total proposal length is seventy-five (75) pages; certain items such as the introduction, staff background, and organizational background can serve for both areas. Offerors proposing for both areas but wishing to be considered for selection for either of the areas separately must keep the details of their 5-year transition, personnel, budget, and financial plans for Areas 1 and 2 clearly separable.

The overall content of proposals should demonstrate a thorough understanding of GLOBE, both its objectives and its current operations. It must also present a clear picture of how the offeror plans to fulfill the roles and responsibilities given in section IV and how the transition from the current operations to the offeror will be conducted. Offerors must provide through their proposal convincing evidence that they share the Governments goals and objectives for the GLOBE Program.

Participation from Entities Outside the United States

NASA accepts proposals from entities outside the U.S. in response to this CAN on a no-exchange-of-funds basis. Proposals from non-U.S. entities should not include a cost plan. Non-U.S. proposals and U.S. proposals that include non-U.S. participants, must be endorsed by the government agency or funding/sponsoring institution from the country in which the non-U.S. participant is located. Such endorsement should indicate that if the proposal is selected, sufficient funds will be made available by the sponsoring foreign agency to undertake the activity proposed.

NASA gives notice to non-U.S. organizations that already have agreements with NASA involving data system interoperability with EOSDIS that these agreements remain in force. Further, foreign organizations are not required to respond to this CAN in order to participate in cooperative efforts with NASA.

Content for Area 1 Proposals

5-year Plan

This plan should describe how each of the roles and responsibilities will be accomplished and should provide a break-down of how each activity will be done. At a minimum the plan must address:

What interactions and regular activities are planned for working with the country coordinators of all participating countries including the US (Area 2);

The functions and architecture planned for the information systems of GLOBE including how the ingest, archival (including all existing data), and distribution of data to participants and the public will be accomplished and which other services will be provided;

How the protocols and all information pertaining to them are to be documented and communicated;

What educational materials are to be supported and how and when any new materials will be developed, whether print, Web, electronic media, or video, etc. will be used and the basis on which these materials will be made available (e.g., provided free or sold);

How and when translation of materials into all six (6) UN languages will be accomplished and what materials are deemed essential and requiring translation;

How the training of partner countries' training teams will be accomplished and what materials will be supplied in support of trainer training and of teacher training;

How the registry of GLOBE teachers, schools, trainers, and master trainers will be implemented;

What metrics will be employed to measure GLOBE progress and operations and reported to the Government; and

A discussion of how planned activities will produce the growth expected over the next 5 years.

Transition Plan

This plan should detail how the transition of on-going activities of GLOBE to the offeror will be accomplished. Offerors should assume that the government will follow their proposed plan in detail. At a minimum the plan should detail:

Which current activities will transition to the offeror's implementing organization, how each transition will be accomplished, and the month-by-month schedule for the transitions;

How essential functions such as information system operations and training will be sustained uninterrupted during the transition;

What existing Government equipment and software, etc. will be transitioned to the offeror's implementing organization;

Which existing staff, if any, will be recruited to join the offeror's implementing organization and when such a transition is proposed to take place; and

When each function will transition in location and where each function will be accomplished once the transition is complete

Content for Area 2 Proposals

5-year Plan

This plan should describe how each of the roles and responsibilities will be accomplished and should provide a break-down of how each activity will be done. At a minimum the plan must address:

Plans for GLOBE's existing US partners, for new partners, and for direct activities for recruiting, training, and providing follow-up support to teachers in US schools;

Specific plans for accomplishing hands-on teacher training in the measurement protocols and use of GLOBE systems and infrastructure;

What, if any, US-specific educational materials are to be supported and how and when any such new materials will be developed and distributed, and the basis on which these materials will be made available (e.g., provided free or sold);

What metrics will be employed to measure GLOBE progress and operations and reported to the Government and the Area 1 organization; and

A discussion of how planned activities will produce the growth expected over the next 5 years.

Transition Plan

This plan should detail how the transition of on-going activities of GLOBE to the offeror will be accomplished. Offerors should assume that the government will follow their proposed plan in detail except that the detailed plan may require adjustments to conform to the requirements of the Area 1 organizations transition plan. At a minimum the plan should detail:

Which current activities will transition to the offeror's implementing organization, how each transition will be accomplished, and the month-by-month schedule for the transitions;

How essential functions such as information training will be sustained uninterrupted during the transition;

What existing Government equipment will be transitioned to the offeror's implementing organization;

Which existing staff, if any, will be recruited to join the offeror's implementing organization and when such a transition is proposed to take place; and

When each function will transition in location and where each function will be accomplished once the transition is complete

VI. Proposal Evaluation Factors

The following evaluation factors are of equal value.

Factor 1: Relevance to NASA objectives in K-12 math, science, and geography education and the purpose and mission of GLOBE

- Degree of understanding of GLOBE (including its purpose, mission, role within science and education, and operations, as demonstrated by the proposed approach and staffing)
- Degree of understanding of how GLOBE can contribute to NASA objectives in K-12 math and science education
- Degree of alignment of the offeror's goals and objectives with NASA's mission in education
- Degree of consistency of offeror's organizational goals and objectives with those of GLOBE

Factor 2: Technical merit

- Overall educational and/or technical merit, including the incorporation of innovative methods or technologies in enhancing GLOBE previous accomplishments to further contribute to NASA educational objectives
- The practicality, appropriateness, and likelihood of success of the 5-year plan and its fulfillment of the assigned roles and responsibilities
- The quality and adequacy of the staff offered or planned for GLOBE implementation and the likelihood that this staff can be obtained and retained

Factor 3: Management and cost

- The reasonableness and appropriateness of the overall financial plan and the allocation of money to the accomplishment of specific activities
- The detailed practicality and likelihood of completion within the allotted time of the transition plan
- The resources, including funding, that the offeror will provide or obtain to help support GLOBE implementation, the adequacy and appropriateness of those resources to the requirements of the various planned activities, and the likelihood that any new resources can be obtained
- The likelihood and extent to which the offeror's plans will lead to the activities of GLOBE implementation becoming self-sustaining within 10 years

VII. Proposal Submission and Schedule

Submit proposals to: CAN-02-OES-02 (GLOBE)
NASA Peer Review Services, Code Y
500 E Street, SW, Suite 200
Washington, DC 20024-2760
TEL: 202/479-9030
FAX: 202/479-0511

Submission deadline and timing: by 4:30 p.m., January 15, 2003

Number of Proposals: Full proposals (1 signed original, 20 copies, and one 3.5" disk or CD containing the full proposal)

Selection Official: Ronald J. Birk, Director
Applications Division
Office of Earth Science

Inquires:

Procurement Contact:

Carl Eichenlaub
Code HS
NASA Headquarters
300 E Street, S.W.
Washington, D.C. 20546
Phone: (202) 358-0390
Fax: (202) 358-4065
E-mail: <mailto:ceichenl@hq.nasa.gov>

Technical Contact:

Dixon M. Butler
Director and Chief Scientist
The GLOBE Program
1800 G Street, N.W.
Washington, D.C. 20006
Phone: (202) 501-3200
Fax: (202) 501-5060
E-mail: CAN@globe.gov

Appendix A

Description of the Current GLOBE Program

The GLOBE Program is a hands-on science and education program that unites students, teachers, and scientists from around the world in study and research about the dynamics of Earth's environment. Over a million GLOBE students in more than 12,000 schools located in over 95 countries participate in taking important environmental measurements and learning from GLOBE materials. These data are used in student's own investigations and are available to scientists around the world for use in research.

The goals of the GLOBE Program are to:

- Increase scientific understanding of Earth,
- Improve student achievement in science and mathematics, and
- Enhance the environmental awareness of individuals worldwide.

Dr. Leon Lederman, Nobel Laureate, has said, "GLOBE is the quintessentially ideal program for involving kids in science,"

The GLOBE Program is implemented through a worldwide network of primary and secondary schools. GLOBE students:

- Take environmental measurements at or near their schools;
- Report their data to the GLOBE data archive via the Web or email;
- Review and analyze GLOBE data sets using local tools and capabilities supplied by GLOBE via the Web;
- Gain an objective perception of the global environment and of the place of their immediate surroundings within it without advocacy biases; and
- Collaborate with scientists and other GLOBE students around the world.

GLOBE students have reported data from over 8 million student measurements in the areas of Atmosphere/Climate, Hydrology, Soils, Land Cover/Biology, and Phenology. GLOBE improves students' understanding of science because it involves them in performing real science – taking measurements, analyzing data, and participating in research in collaboration with other students, as well as with scientists.

Scientists working with educators have developed measurement protocols that produce research quality data and can be done by students in grades K-12. Scientists working with GLOBE and instrument suppliers have determined specifications for instruments and other equipment needed to take measurements accurately and consistently. These instruments are readily available and affordable for schools in developed countries and easily obtainable by public or private aid supporters of GLOBE implementation in less developed countries. Educators working with scientists have developed age-appropriate environmental science educational materials as a resource for GLOBE teachers. These materials complement the measurement protocols and are made available via the GLOBE Website.

Professional development workshops are held by GLOBE's partners and include hands-on training in measurement techniques that enable GLOBE teachers to guide their students in taking measurements according to scientific protocols, in using email and the Web to report and analyze scientific data, and in creating partnerships among students at GLOBE schools around the world. GLOBE has supplied a Teacher's Kit to most trainees that includes the Teacher's Guide, protocol videos, a CD-ROM-based tutorial, and other items.

GLOBE is an interagency program of the National Aeronautics and Space Administration, National Science Foundation, and the Department of State. In the past, the National Oceanic and Atmospheric Administration, the US Environmental Protection Agency, and the Department of Education have supported and been involved in GLOBE.

Broad international participation is integral to the design of the GLOBE Program. Bilateral agreements establish partnerships between the United States and its partner countries. Each individual country is responsible for designing its own program implementation.

GLOBE Partnerships

INTERNATIONAL PARTNERSHIPS: GLOBE enters into formal agreements with countries all over the world. In these partnerships, GLOBE provides the program infrastructure. Each international partner manages and provides funding for its own in-country implementation, acquiring the resources from government, private sector and non-profit sources. GLOBE partners determine implementation strategies consistent with their countries' educational systems and priorities.

US PARTNERSHIPS: Implementation of the GLOBE Program in the United States currently depends upon the efforts of more than 100 US Partners — universities, state departments of education, school districts and non-profit organizations. US Partners raise their own funds, leveraging the Federal investment in the program, to deliver GLOBE in their areas. US Partners recruit schools, train teachers, provide follow-up support, and help in the adaptation of the program to state and local standards and requirements.

ADDITIONAL PARTNERSHIPS: GLOBE enters into formal agreements with certain US and international organizations to support overall program implementation. These organizations include youth groups, volunteer adult societies, and satellite missions.

Science Content

GLOBE measurements fall into two main categories: Regular and Special. The Regular measurements have all been proposed and selected through peer-reviewed proposals with NSF providing funding for the selected research groups from US institutions. At present, there are 11 selected research groups all based in the US. The Regular measurements are further sub-divided into categories of Basic, Advanced, and Optional. GLOBE conducts trainer training and tracks trainer and master trainer certification in the following Basic and Advanced areas:

- Atmosphere (Basic)
- Atmosphere (Advanced)
- Hydrology (Basic and Advanced Combined)
- Soil Moisture and Temperature (Basic)
- Soil Characterization (Basic)
- Soil Characterization (Advanced)
- Land Cover/Biology (Basic)
- Land Cover/Biology (Advanced)
- Phenology (Basic)

In addition, there are a number of Optional measurements for which training is not provided.

GLOBE has also selected a set of Special Measurements. In these cases, researchers have requested that GLOBE work with participating schools to obtain additional types of data for use in science or applied science investigations that are supported independently from GLOBE. GLOBE does not provide training in Special Measurements.

Training

GLOBE conducts train-the-trainer workshops in the US and regionally around the world to provide certified teacher trainers for its partners. In addition, GLOBE selects a few trainers to help in further training workshops as part of a process of becoming Master Trainers. Certified Master Trainers may train trainers while regular trainers are certified to train teachers. At present, GLOBE brings to most train-the-trainer workshops a training team and all equipment and supplies needed to conduct the training. In addition, a special training server is provided through the GLOBE Website in support of all forms of GLOBE training. GLOBE Partners provide local support to host such trainings including classrooms, labs, outdoor training sites and computer labs. Given shipping costs and advantages to the Program, GLOBE currently leaves behind all equipment provided to non-US workshops.

GLOBE supports teacher training in the various individual protocols and groups of protocols conducted by its partners. This support chiefly includes the provision of Teacher's Kits to many partners, certification of trainers to conduct teacher training workshops, and the provision of the training Website where data may be entered and reviewed for practice without the data becoming part of the permanent GLOBE data archive. GLOBE's partners provide teachers they train with IDs that enable their schools to report data to GLOBE and to use the GLOBEMail system. The

partners also report to GLOBE the names of trained teachers and of their schools and GLOBE maintains a database of this information.

In GLOBE, training is hands-on with each trainee going through each procedure personally in locations that are as close to real world conditions as possible. So, field measurements are done outdoors under realistic conditions and trainees report data to the training server and view and retrieve data from the Website (on-line or simulated locally). It is expected that trainees will practice measurement techniques, etc. before trying to train teachers or students themselves.

Education

Reform in science and mathematics education has focused on the importance of students learning the scientific method and accomplishing a scientific inquiry following this method. GLOBE provides students the opportunity to do research using their own data and that of their peers around the world. With GLOBE data, students can propose testable hypotheses, take measurements, analyze data, draw conclusions and publish their results (on the GLOBE Web site) — in short, they can learn authentic science using a database they helped to create.

The GLOBE Program is implemented in schools, domestic and international, under the guidance of teachers who have participated in teacher-training workshops. These professional development workshops enable teachers to guide students in taking the measurements according to scientific protocols, in using classroom computers and the Internet in a meaningful way, in using GLOBE data in student research, and in creating partnerships among students at GLOBE schools around the world. More than 10,000 in-service and pre-service teachers have participated in GLOBE workshops in preparation for implementing GLOBE in their schools.

Implementation of GLOBE in schools and with youth organizations is designed and accomplished by GLOBE's many partners, schools, and teachers. GLOBE's only requirements are that teachers receive hands-on training in the measurement protocols, and that measurements are taken following the protocols and using instruments that meet specifications.

Educational Materials

The *GLOBE Teacher's Guide* contains the protocols for the GLOBE measurements, instrument specifications, information about environmental science topics to provide a context for the measurements, and age-appropriate learning activities, which involve students in the whole process of science. Additional learning activities are provided to complement GLOBE's *Earth System Poster*. A *GLOBE Cloud Chart* and *MUC Field Guide* are also available. Computer-based tutorials are provided to help teachers master certain procedures. Videos providing an overview of the Program and demonstrating the various GLOBE protocols are also available. GLOBE is not a curriculum but rather a resource for GLOBE teachers. Teachers adapt the program so as to integrate it into their local classrooms.

These educational materials are currently provided through the GLOBE Website and in print or physical media (e.g., video tapes, CD-ROMs) to all trainers at train-the-trainer workshops, all US

teachers trained by GLOBE's US partners, and to selected teachers at international teacher training workshops.

Data and Information Systems

GLOBE makes much use of information systems technology and maintains an extensive Website at www.globe.gov. The GLOBE Website provides the principal means for the ingest and distribution of measurement and administrative data, for communication between GLOBE and program participants, and is becoming the main means for distribution of GLOBE educational materials including the Teacher's Guide. The Website also provides a means for communication among GLOBE schools known as GLOBEMail. Lists of GLOBE partners are provided along with information about these. Information is also made available about each GLOBE school, including its teachers and data. A roster of schools reporting many measurements and a roster of schools that have made the Chief Scientist's Honor Roll are maintained. Information about trainings and news stories about partners as well as general information for the public about the GLOBE Program is provided as well. A number of administrative services are offered in support of GLOBE partners.

Beyond the Website, GLOBE provides for the ingest of data through an e-mail data entry system and for scanning into electronic form conventional photographs and drawings associated with certain measurement protocols. GLOBE maintains a database of frequently asked questions and their answers and of contacts in support of the GLOBE Help Desk. GLOBE operates an archive of all GLOBE data and of all administrative information about GLOBE.

Program Evaluation

SRI International has been competitively selected by the NSF to provide annual independent program evaluations. SRI evaluates the performance of the GLOBE Program using student and teacher surveys, interviews and site visits. SRI has found that participation in GLOBE increases the likelihood that teachers will engage their students in *doing* science (such as making measurements or observations, applying concepts, and interpreting data) rather than limiting their students to memorizing concepts and definitions of terms. GLOBE improves students' higher order thinking skills through activities such as interpreting data and drawing inferences. Further, there is evidence that involvement in GLOBE activities increases not just students' ability to take the environmental measurements included in the program, but also their ability to apply more broadly principles of sound sampling and data collection and to interpret data.

SRI concludes GLOBE is an ambitious attempt to put the concepts of authentic learning, student-scientist partnership and inquiry-based pedagogy into practice on an unprecedented scale. There is statistically significant evidence that enhanced science and mathematics learning is taking place in GLOBE classrooms.

Appendix B

Definitions of Key Terms as Used in Connection with GLOBE

GLOBE Master Trainer: An individual recognized by GLOBE (Area 1) as qualified to train trainers.

GLOBE Teacher: An individual who has received hands-on training in some GLOBE measurement protocols from a GLOBE trainer.

GLOBE Trainer: An individual who has received hands-on training in an entire set of GLOBE measurement protocols (e.g., Basic Atmosphere) or who is recognized by GLOBE as a technical expert committed to providing training consistent with the GLOBE protocols; trainers train teachers.

GLOBE School: A school that has had a GLOBE teacher on staff.

School: A school, youth group, museum, park, or other venue where students take data under the supervision of a teacher.

Teacher: A teacher, youth group leader, museum docent, park ranger, or other individual who provides instruction to students and can supervise data collection.

UN Languages: Arabic, Chinese, English, French, Russian, and Spanish; the languages for which translation is routinely provided by the United Nations.

Appendix C

GLOBE Measurement Protocols and Levels of Support

GLOBE has worked with science investigation teams to develop and support a number of measurement protocols. Additional protocols are under development, all of which should be completed and in use prior to March 1, 2003. Area 1 offerors must provide support for all of the protocols listed below. The full statement of existing protocols is given in the GLOBE Teacher's Guide for Basic, Advanced, and Optional measurements and on the GLOBE Website (www.globe.gov) for all measurements. Specific background information for each of the protocols listed as "in development" is provided for potential offerors on the GLOBE Website (click on <CAN>).

There are four measurement types in GLOBE:

- Basic (including universal and area specific)
- Advanced
- Optional
- Special

GLOBE provides varying degrees of support and has different expectations for training and implementation by GLOBE schools for each of these types. These are given below.

Basic Measurements

Universal protocols:

Teacher training: recommended

Trainer training: offered

School implementation: highly desirable for all schools

Inclusion in Teacher's Guide: yes

Protocol Video: yes

Written & Web distribution to schools: yes

Systems support: yes

PI funding at US institutions: yes

Area specific protocols:

These are basic protocols that measure phenomena that do not occur worldwide such as snow.

Teacher training: recommended where the protocol can be implemented

Trainer training: offered

School implementation: highly desirable for all schools where the protocol can be implemented

Inclusion in Teacher's Guide: yes

Protocol Video: yes

Written & Web distribution to schools: yes

Systems support: yes

PI funding at US institutions: yes

Advanced Measurements

Teacher training: desirable
Trainer training: offered
School implementation: highly desirable for all schools
Inclusion in Teacher's Guide: yes
Protocol Video: yes
Web distribution to schools: yes
Written distribution to schools: no, except for schools lacking Internet connectivity
Systems support: yes
PI funding at US institutions: yes

Optional Measurements

Teacher training: optional
Trainer training: not offered routinely
School implementation: optional
Inclusion in Teacher's Guide: yes
Protocol Video: case by case decision
Web distribution to schools: yes
Written distribution to schools: no except for schools lacking Internet connectivity
Systems support: yes
PI funding at US institutions: yes

Special Measurements

Teacher training: optional
Trainer training: not offered routinely
School implementation: desirable particularly for schools identified by the PI
Inclusion in Teacher's Guide: yes for the 2003 GLOBE Teacher's Guide
Protocol Video: no
Web distribution to schools: yes
Written distribution to schools: no except in special situations lacking Internet connectivity
Systems support: yes
PI funding at US institutions: no

Description of Support Items

Trainer training: GLOBE trainers are trained in the protocols in a train-the-trainer (TTT) workshop provided or sanctioned by GLOBE. Master trainer development is provided.

Teacher training: GLOBE teachers are trained in the protocols in a workshop or other forum. This training is person-to-person and involves hands-on conduct of the protocol by the trainee. Training is delivered by GLOBE trained instructors except in the cases where a local expert is used or an alternative trainer has been approved by GLOBE. Teacher training is the responsibility of the GLOBE partner countries (including Area 2 offerors for the United States).

School implementation: Schools have students take data following the measurement protocol and report the data to GLOBE, provided the protocol is grade appropriate for the students.

Inclusion in Teacher's Guide: The protocol and associated material, including science background information, learning activities or similar supports for classroom implementation, instrument specifications, and data entry sheets, are included at least in the Web version of the Teacher's Guide.

Protocol Video: GLOBE has produced and distributes a video for the protocol. The video is aimed at teachers with students as a secondary audience. The video complements the Teacher's Guide and provides an illustration of how the protocol is conducted and key pointers on how to take the measurements correctly.

Web distribution to schools: GLOBE provides the Teacher's Guide to everyone via the Web.

Written distribution to schools: GLOBE provides to all trainers and to schools in the US the text and graphic material associated with the protocol as a printed GLOBE Teacher's Guide.

Systems support: GLOBE provides for the entry of data, the visualization of these data, the archival of data as part of the GLOBE Data Archive, and the distribution of these data to all who request them. Distribution is provided in formats that are compatible with easy ingest into spreadsheets and geographic information systems software as well as in on-line images or tables of data. Off-line and FTP delivery of significant amounts of data are provided on request.

PI funding at US institutions: If the Principal Investigator and research team, including an educator Co-principal Investigator, are at US institution(s), they may receive funding from NSF as GLOBE investigators for the conduct of research using the data gathered following the protocol, development and maintenance of the protocol related materials, review of all data submitted for the protocol for accuracy and adequacy for use in research, interaction with students and teachers including support for training, and the provision of supporting educational materials. If the PI and team are at a non-US institution, they may receive this support from a national source in their country or from a multilateral funding entity.

GLOBE Protocols

Atmosphere/Climate

Existing:

- Clouds (Basic)
- Aerosol (Advanced)
- Relative Humidity (Basic)
- Precipitation (Basic)
- Max/Min/Current Air Temperature (Basic)
- Digital Multi-Day Max/Min/Current Air and Soil Temperatures (Basic)
- Surface Ozone (Advanced)
- Automated Soil and Air Temperature Monitoring (Optional)
- Barometric Pressure (Optional)

In Development:

- Contrails (Basic)
- Column Water Vapor (Advanced)
- UV-A (Advanced)

GPS

Existing:

- GPS Measurement (Basic)

Hydrology

Existing:

- Collecting the Water Sample (Basic)
- Water Transparency (Basic)
- Water Temperature (Basic)
- Dissolved Oxygen (Basic)
- pH (Basic)
- Electrical Conductivity (Basic)
- Salinity (Basic)
- Alkalinity (Basic)
- Nitrate (Basic)
- Salinity Titration (Optional)

In Development:

- Freshwater Macroinvertebrates (Optional)
- Modified Alkalinity (Basic)
- Modified pH (Basic)
- Alternative Nitrate Kits (Optional)

Soil

Existing:

- Soil Characterization (Basic)
- Bulk Density (Basic)
- pH (Basic)
- NPK (Advanced)
- Soil Temperature (Basic)
- Soil Moisture (Basic)
- Particle Size Distribution (Advanced)
- Automated Soil and Air Temperature Monitoring (Optional)
- Soil Moisture Sensor (Optional)
- Infiltration (Optional)
- Soil Particle Density (Advanced)

In Development:

- Surface Temperature (Advanced)
- Automated Soil Moisture (Optional)

Land Cover/Biology

Existing:

- Land Cover Sample Site (Basic)
- Biometry (Basic)
- Manual Interpretation Land Cover Mapping (Basic)
- Unsupervised Clustering Land Cover Mapping (Advanced)
- Accuracy Assessment (Basic/Advanced)

In Development:

- Land Cover Change (Optional)

Earth as a System/Phenology

Existing:

- Green-up / Green-down (Basic)
- Ruby-throated Hummingbird (Optional)

In Development:

- Phenology Gardens (Optional)

Special Measurements

Existing:

- Clonal and Common and Lilac
- Budburst (in transition to Earth as a System/Phenology, Basic)

In Development:

- Automated Weather Stations: Davis, AWS, others
- Fire Fuel
- Marine Macroinvertebrates
- Seaweed Phenology
- Artic Bird Monitoring

Appendix D

Current GLOBE Science and Education Investigation Teams

The National Science Foundation has selected the following investigations teams. They were selected through the competitive review process customarily used by NSF for 42-month periods. The start dates are nominally August 1, 2002, but vary slightly from investigation to investigation. The next solicitation will be timed to allow for those selected to receive funding by February 1, 2006. This set of science investigations includes support by at least one team for all basic, advanced, and optional protocols.

Science Investigation Teams:

Bales, Roger; roger@hwr.arizona.edu; University of Arizona; 601 Administration Bldg., Tucson AZ 85721; Martha Conklin/University of Arizona, Jacqueline Kahn; *Hydrologic Investigations within the GLOBE Program*

Brooks, David; dbrooks@mcs.drexel.edu; Drexel University; 3201 Arch Street, Philadelphia PA 19104; Tamara Ledley/TERC Inc., Pieternel Levelt/KNMI (Netherlands), Forrest Mims/IEEE, Stephanie Stockman/NASA-GSFC; *The Aerosol Monitoring Project: Student/Teacher/Scientists Atmospheric Science for the 21st Century*

Chambers, Lin; l.h.chambers@larc.nasa.gov; NASA Langley Research Center; Hampton VA 23681-0001; Douglas Stoddard/NASA-LaRC; *Contrails: A New Atmospheric Measurement Protocol for GLOBE*

Congalton, Russell; russ.congalton@unh.edu; University of New Hampshire; Service Building 107, Durham NH 03824; Mimi Becker/University of New Hampshire; *Scientific Support for the GLOBE Land Cover Investigation*

Czajkowski, Kevin; kczejko@pop3.utoledo.edu; University of Toledo; 2801 West Bancroft, Toledo OH 43606-3328; Alison Sponberg/University of Toledo, Mark Templin/University of Toledo; *Energy and Earth Systems: GLOBE Protocol Research and Outreach*

Fishman, Jack; j.fishman@larc.nasa.gov; NASA Langley Research Center; Hampton VA 23681-0001; Linda Bush/Knox College, Russell Deyoung/NASA-LaRC, Irene Ladd, Margaret Pippin/NASA-LaRC; *Improvements to Surface Ozone Measurements for GLOBE*

Hilton, William; funding@hiltonpond.org; Hilton Pond Center for Piedmont Natural History; York SC 29745-2119; Mark Miller, James Shuman/St. Lawrence University; *Operation Rubythroat: The Hummingbird Project*

Levine, Elissa; elissa@ltpmail.gsfc.nasa.gov; NASA Goddard Space Flight Research Center; Greenbelt MD 20771-0001; Susan Riha/Cornell University, Stephanie Stockman/NASA-GSFC; *Understanding Environmental Variability and Change Through Modeling Soil Processes*

Stephens, Graeme; stephens@atmos.colostate.edu; Colorado State University; Fort Collins CO 80523-2002; Roger Pielke/Colorado State University; *On the Maintenance of the GLOBE Atmosphere Investigation Protocols and Application of these Protocols in the Study of Land-Atmospheric Climate Feedbacks*

Washburne, James; jwash@hwr.arizona.edu; University of Arizona; 601 Administration Building, Tucson AZ 85721; Paul Ferre/University of Arizona, Bart Nijssen/University of Arizona; *GLOBE Soil Moisture Investigation*

White, Michael; mikew@cc.usu.edu; Utah State University; Logan UT 84322-1415; Robert Gillies/Utah State University, Leslie Gordon/University of Alaska at Fairbanks, Elena Sparrow/University of Alaska at Fairbanks; *Integrated Phenology Research and Education*

Independent Program Evaluation Team:

Penuel, William; william.penuel@sri.com; SRI International; 333 Ravenswood Ave., Menlo Park CA 94025-3493; Lionel Hinojosa/SRI, Perry Samson/Univ. of Michigan, Louise Yarnall/SRI; *Evaluation of the Global Learning to Benefit the Environment (GLOBE) Program: A Systemic Approach*

Education Investigation Teams:

List, Henrietta; hlist@maine.edu; Maine Mathematics and Science Alliance; 77 Sewall Street, Augusta ME 04332-5359; Stephan Zeeman/University of New England; *Students and Scientists: Together Advancing Science Knowledge*

McWilliams, Harold; harold_mcowilliams@terc.edu; TERC Inc.; 2067 Massachusetts Ave, Cambridge MA 02140; Gillian Puttick/TERC Inc.; *GLOBE: Learning Links for Professional Development*

Turco, Richard; turco@atmos.ucla.edu; University of California at Los Angeles; 10920 Wilshire Blvd, Los Angeles CA 90024-1406; Noel Enyedy/UCLA, Robert Fovell/UCLA, William Hamner/UCLA, Arthur Winer; *GLOBE in the Urban Environment*

Appendix E

GLOBE International Agreements

The following is the text of a generic GLOBE international agreement. This is the version that has been used when the National Oceanic and Atmospheric Administration was the lead agency for GLOBE. NASA has assumed this responsibility, and every country partner is being notified that NASA has assumed the responsibilities under these agreements on behalf of the United States Government. Future agreements will be similar but not identical to this one, and the final form will be made available to offerors if it is completed before January 1, 2003.

-----beginning of generic agreement text-----

Example agreement between

the National Oceanic and Atmospheric Administration
of the United States of America and
the (Organization) of (Country/long)
for Cooperation in
the GLOBE Program

PREAMBLE

The U.S. National Oceanic and Atmospheric Administration, acting on behalf of itself and other U.S. Government agencies participating in the GLOBE Program (hereinafter, the U.S. side), and the (Organization) of (Country/long) (hereinafter, the (Country's) side),

Intending to increase the awareness of students throughout the world about the global environment,

Seeking to contribute to increased scientific understanding of the Earth, and

Desiring to support improved student achievement in science and mathematics,

Have agreed to cooperate in the Global Learning and Observations to Benefit the Environment (GLOBE) Program as follows:

ARTICLE 1 - THE GLOBE PROGRAM

The GLOBE Program is an international environmental science and education program that brings students, teachers, and scientists together to study the global environment. GLOBE has created an international network of students at primary, middle and secondary school levels studying environmental issues, making environmental measurements, and sharing useful environmental data with one another and the international science community.

ARTICLE 2 - RESPECTIVE RESPONSIBILITIES

A. The U.S. side will:

1. Identify U.S. schools that will participate in the GLOBE Program (details regarding GLOBE schools in Appendix A);
2. Select, in consultation with international scientists and educators, the GLOBE environmental measurements and define specifications for measurement equipment (detail provided in Appendix B);
3. Select Principal Investigator Teams for the GLOBE environmental measurements, and support the U.S. members of the Teams;
4. Develop, in consultation with international scientists and educators, GLOBE educational materials;
5. Translate GLOBE instructional materials related to measurement procedures and data reporting protocols into the six United Nations languages, and provide a copy of these plus all broader GLOBE educational materials to the (Country's) side for further reproduction as necessary;
6. Conduct regional training sessions for GLOBE Country Coordinators and GLOBE teachers who will serve as trainers for additional GLOBE teachers in (Country);
7. Design, develop, operate, and maintain GLOBE data processing capabilities and other necessary technology and equipment;
8. Provide GLOBE software, as necessary, for use on (Country's) GLOBE school computers (To the extent possible, textual material appearing on computer screens will be accessible in the student's choice among the six United Nations languages.);
9. Accept environmental data reported from GLOBE schools around the world, and develop and provide resultant global environmental images to the (Country's) side; and
10. Evaluate the overall GLOBE Program periodically, in consultation with international GLOBE Country Coordinators, and modify the overall program as appropriate.

B. The (Country's) side will:

1. Identify (Country's) schools that will participate in the GLOBE Program (details regarding GLOBE schools in Appendix A) and provide an updated list of (Country's) GLOBE schools to the U.S. side at the beginning of each school year;
2. Ensure that (Country's) GLOBE schools conduct the fundamental activities of GLOBE schools detailed in Appendix A (take GLOBE environmental measurements, report data, and receive and use resultant global environmental images, using GLOBE educational materials under the guidance of teachers trained to conduct the GLOBE Program);
3. Name a (Country's) Government Point of Contact responsible for policy-level communications with the Director of the GLOBE Program;
4. Name a Country Coordinator responsible for day-to-day management, oversight, and facilitation of the GLOBE Program in (Country);
5. Ensure that the Country Coordinator and some GLOBE teachers attend GLOBE regional training and in turn provide GLOBE training to at least one teacher in each (Country's) GLOBE school;
6. Ensure that GLOBE instructional materials related to measurement procedures and data reporting protocols are utilized in (Country's) GLOBE schools, and that broader GLOBE educational materials are appropriately translated, adapted, reproduced, and distributed to all (Country's) GLOBE schools;
7. Ensure that the measurement equipment used by GLOBE schools to take GLOBE environmental measurements meets GLOBE specifications (described in Appendix B);
8. Ensure that teachers and students at (Country's) GLOBE schools calibrate GLOBE measurement equipment according to procedures provided in GLOBE instructional materials;
9. Ensure that (Country's) GLOBE schools have the necessary computer and communications systems to allow Internet/World Wide Web access in order to report GLOBE environmental measurements and to receive and use GLOBE environmental images; if such computer and communications systems are not available in (Country's) schools, make agreed alternative arrangements for such reporting and receipt (At a minimum, the (Country's) Country Coordinator will need access to the Internet so that all measurement data from (Country's) GLOBE schools will be reported via Internet.); and
10. Evaluate GLOBE operations in (Country) periodically and assist the U.S. side in conducting periodic evaluation of the overall GLOBE Program.

ARTICLE 3 - FINANCIAL ARRANGEMENTS

Each side will bear the costs of fulfilling its respective responsibilities under this agreement. Obligations of each side pursuant to this agreement are subject to its respective funding

procedures and the availability of appropriated funds, personnel, and other resources. The conduct of activities under this agreement will be consistent with the relevant laws and regulations of the United States and (Country).

ARTICLE 4 - EXCHANGE OF DATA AND GOODS

GLOBE environmental measurement data, global environmental images, software, and educational materials will be available worldwide without restriction as to their use or redistribution.

ARTICLE 5 - RELEASE OF INFORMATION ABOUT THE GLOBE PROGRAM

Each side may release information on the GLOBE Program as it may deem appropriate without prior consultation with the other.

ARTICLE 6 - CUSTOMS AND IMMIGRATION

Each side will use its best efforts to facilitate the movement of persons and goods into and out of its territory and to accord entry to such goods into U.S. and (Country's) territory free of customs duties and other similar charges, as is necessary to implement this agreement, to the extent permitted by the laws and regulations of the United States and (Country).

ARTICLE 7 - DURATION

This agreement will enter into force upon signature of the two sides and will remain in force for five years. It will be automatically extended for further five-year periods, unless either side decides to terminate it and so notifies the other side with three months written notice. This agreement may be terminated at any time by either side upon three months prior written notice to the other side. This agreement may be amended by written agreement of the two sides.

Done at _____ on the _____ day of _____, 2002, in duplicate[, in the English and _____ languages, both texts being equally authentic].

For the National Oceanic and
Atmospheric Administration:

For the (Organization):

APPENDIX A

GLOBE Schools

Each partner country is responsible for identifying its participating schools. Schools should be selected so as to satisfy the objectives of the GLOBE Program. In particular, countries should emphasize the selection of schools that will maximize the number and geographic distribution of students worldwide participating in the program. Also, countries should consider involving schools in locations that will yield measurement data that is important to the international science community.

Students at all GLOBE schools throughout the world conduct the following fundamental activities: they make environmental measurements at or near their schools; report their data to a GLOBE data processing site; receive vivid graphical global environmental images created from their data and the data from other GLOBE schools around the world; and study the environment by relating their observations and the resulting images to broader environmental topics. All of these activities are conducted under the guidance of specially trained teachers (GLOBE-trained teachers).

GLOBE educational materials are used in GLOBE schools under the guidance of GLOBE-trained teachers. These materials contain instructional materials detailing procedures for taking environmental measurements and protocols for reporting data; they also explain the significance of the measurements, guide the use of the global environmental images, and integrate the measurement aspects of the program into a broader study of the environment.

APPENDIX B

GLOBE Environmental Measurements and Equipment

GLOBE environmental measurements contribute in a significant way to the scientific understanding of the dynamics of the global environment. The set of GLOBE measurements reflects the desire of GLOBE Program management, scientists, and educators to respond to the needs of the education community as well as to provide scientifically useful environmental data. All GLOBE Schools are strongly encouraged to participate in the full range of GLOBE Science measurements. Instrument costs vary, depending on the optional methodologies selected and on equipment already available. GLOBE instruments need to meet functional and performance specifications; they do not need to be purchased from specific vendors.

ATMOSPHERE/CLIMATE STUDIES

Air Temperature: maximum, minimum, current

Precipitation: rain, snow, pH

Cloud cover/ type

Relative Humidity

Ozone

Aerosols

Barometric Pressure

HYDROLOGY STUDIES

Surface Water Temperature

Surface Water Chemistry: pH, alkalinity, dissolved oxygen,
nitrates, salinity, electrical conductivity

Transparency

SOILS STUDIES

Soil Temperature

Soil Moisture

Soil Characterization: structure, color, texture, pH, fertility, porosity

LAND COVER/PHENOLOGY

Canopy and ground cover,

Biometry (tree height, diameter, grass biomass)

Species Identification

Land Cover classification and mapping

Phenology: Green up and green down

APPENDIX C

GLOBE Computer and Communications Systems

In order to derive maximum benefit from the GLOBE Program, all schools are encouraged to use the Internet, along with classroom computers. The Internet/World Wide Web multi-media information-access capability has been selected to support the required GLOBE school activities of data entry, data analysis, and use of global environmental images.

The diversity of technology accessible by schools worldwide may require, in some cases, that environmental measurements be reported via e-mail or in hardcopy and that a variety of media, including e-mail and hardcopy, be used to distribute global environmental images. All schools that want to participate in the program will be accommodated.

Technology associated with the GLOBE Program will continually evolve to higher levels and participants will be encouraged to upgrade over time.

-----end of generic agreement text-----

The following table lists the existing GLOBE International Agreements, along with information about the signing of each. GLOBE is continuing to develop and conclude agreements with additional countries and organizations.

Argentina	Agency to Agency	Ambassador. James R. Cheek and Minister of Education, Jorge Rodriguez; at Buenos Aires, 6-28-95
Australia	Agency to Agency	Kaarn J. Weaver, Charge d'Affaires, a.i., and Stuart Hamilton, Secretary, Department of Environment, Sport and Territories; at Canberra, 4-21-95
Austria	Agency to Agency	Ambassador. Swanee Hunt and Vice-Chancellor and Minister of Education and Cultural Affairs, Erhard Busek; at Vienna, 4-20-95
Bahamas	Agency to Agency	Honorable Zhizargo Laing, Minister of State for Education and Youth signed the GLOBE agreement at the Ministry of Education and Youth in Nassau, Bahamas with US Ambassador Arthur Louis Schechter on 7-21-2000
Bahrain	Agency to Agency	His Excellency Dr. Mohamed Bin Jassim Alghatam, Minister of the Ministry of Education and U.S. Charge' d'Affaires Joseph Mussomeli signed the official bilateral agreement in Manama on 6-16-2001
Bangladesh	Agency to Agency	Secretary M. Fazlur Rahman of the Ministry of Science and Technology and U.S. Ambassador Mary Ann Peters signed the official bilateral agreement in Dhaka on 10-20-2000
Belgium	Agency to Agency	Ambassador. Alan J. Blinken and Bernd Gentges, Minister of Education, Culture, Youth, and Scientific Research (German-speaking Community); at Brussels, 3-24-95. Ambassador Alan J. Blinken and Luc Van den Bossche, Minister of Education and Civil Service (Flemish-speaking Community); at Brussels, 3-24-95
Benin	Government to Government	Ambassador. Ruth A. Davis and Minister of Foreign Affairs and Cooperation, Robert M. Dossou; at Cotonou, 4-28-95
Bolivia	Government to Government	Ambassador. Curtis Kamman; Dr. Antonio Aranibar Quiroga, Minister of Foreign Affairs; and Ing. Luis Lema Molina, Minister of Sustainable Development and the Environment; at La Paz, 4-22-95
Bulgaria	Agency to Agency	Ambassador Avis T. Bohlen and Bulgarian Minister of Education and Science Vesselin Metodiev at Sofia, 9-9-98
Burkina Faso	Agency to Agency	NOAA Administrator Dr. James Baker and Ambassador Bruno Nongoma Zidouemba at Washington, D.C. 12-18-98
Cameroon	Agency to Agency	Ambassador Yates and GRC Minister of State in charge of National Education Charles Etoundi at Yaounde, 1-13-99

Canada	Government to Government	Deputy Assistant Sec of State for European Affairs, Earl Anthony Wayne; and Canadian Ambassador to the US, Raymond Chretien at Washington DC, 4-7-97
Cape Verde	Agency to Agency	Ambassador Michael D. Metelits and Cape Verdian Minister of Education, Fernandes at Praia, 8-9-00
Chad	Agency to Agency	Under Secretary of Commerce D. James Baker, at Washington DC, 11-28-95; & Mariam Mahamat Nour, GOC Planning and Cooperation Minister, at N'Djamena, 9-27-95
Chile	Agency to Agency	Secretary of Commerce William Daley and Minister of Education, Jose Pablo Arellano Marin; at Santiago, 4-16-98
China	Agency to Agency	Secretary of Commerce Ronald H. Brown and Xie Zhenhua, Administrator, National Environmental Protection Agency; at Beijing, 10-18-95
Colombia	Agency to Agency	Deputy Undersecretary of Commerce for Oceans and Atmosphere Scott Gudes and Foreign Minister de Soto; at Washington D.C., 10-28-98
Costa Rica	Government to Government	Ambassador. Peter Jon de Vos.; Eduardo Doryan Garron, Minister of Public Education, and Rene Castro Salazar, Minister of the Environment and Energy; at San Jose, 4-22-96
Croatia	Agency to Agency	Ambassador. Peter W. Galbraith; Prof. Ljilja Vokic, Minister of Education and Sport, and Dr. Viktor Simoncic, Vice Minister for the State Directorate for Environment; at Zagred, 4-12-95
Cyprus	Agency to Agency	Ambassador Kenneth C. Brill and Cypriot Minister of Education and Culture, Lycourgos Kappas at Nicosia, 11-24-98
Czech Republic	Agency to Agency	Ambassador. Adrian A. Basora & Minister of Education, Youth and Sports, Ivan Pilip; at Prague, 4-20-95
Denmark	Agency to Agency	Ambassador. Edward E. Elson and Danish Minister of Education Ole Vig Jensen signed the GLOBE Agreement at the Danish Ministry of Education, with GLOBE Program Director Tom Pyke from GLOBE; 5-29-97
Dominican Republic	Agency to Agency	Ambassador Donna J. Hrinak and Technical Secretary to the President, Eduardo Selman, and Secretary of Education, Ligia Amada Melo de Cardona; at Santo Domingo, July 1997
Ecuador	Agency to Agency	Ambassador. Peter Romero and Ecuadorian Minister of Education, Dr. Roberto Passailaigue Baquerizo; at Quito, 4-22-96

Egypt	Agency to Agency	Ambassador. Ned Walker and Dr. Hussein Kamel Baha' El Din, Minister of Education; with VP Gore and Egyptian President Hosni Mubarak looking on; at Cairo, 3-20-95
El Salvador	Government to Government	Ambassador. Alan H. Flanigan and Minister of Education Cecilia de Cano; at San Salvador, 12-11-95
Estonia	Agency to Agency	Ambassador. Lawrence Taylor and Minister of Education Jaak Aaviksoo; at Tallinn, 6-18-96
Fiji	Agency to Agency	Ambassador. Don Gevirtz and Minister of Education Taufa Vakatale; at Suva 1-28-97
Finland	Agency to Agency	Ambassador Shearer and National Board of Education; at Helsinki 3-23-95
FYROM	Government to Government	Exchange of Diplomatic notes on behalf of NOAA between the Ministry of Foreign Affairs of the Former Yugoslav Republic of Macedonia and the Embassy of the United States on 8-24-98
The Gambia	Agency to Agency	Ambassador Under Secretary of Commerce D. James Baker and Ndey-Isatou NJIE, Executive Director of the National Environmental Agency of Gambia; 7-12-96
Germany	Agency to Agency	Ambassador Charles E. Redman and DLR Chairman of the Board, Dr. Walter Kroell; at Bonn, 12-8-95
Ghana	Agency to Agency	Ambassador Edward Brynn and Deputy Minister of Education, Dr. Mohammed Ibn Chas; at Accra, 3-20-98
Greece	Agency to Agency	Ambassador. Thomas M. T. Niles; Georgios Papandreou, Minister of National Education and Religious Affairs, and Elissavet Papazoi, Deputy Minister of Environment, Physical Planning and Public Works; at Athens, 12-12-95
Guatemala	Agency to Agency	Ambassador Planty and Vice Minister of Education, Julieta de Morales, 12-5-97
Guinea	Agency to Agency	Ambassador Tigor Nagy and Minister of Pre-University Education, Germain Doualamou; at Conakry, 5-14-98
Honduras	Agency to Agency	Ambassador James F. Creagan and Under Secretary of Environment, Sergio Alejandro Zelaya; at Tegucigalpa, 11-13-97
Hungary	Agency to Agency	NOAA Administrator Dr. James Baker and Deputy State Secretary for Public Administration and International Relations, Dr. Norbert Kroo; at GLOBE Headquarters, Washington D.C., 3-10-99
Iceland	Agency to Agency	Ambassador Day Mount and Icelandic Minister of Education Bjorn Bjarnason and Icelandic Minister of Agriculture and Environment Gudmundur Bjarnason; Reykjavik, 5-30-97

India	Agency to Agency	Albert A. Thibault, Charge d' Affaires ad interim, at the U.S. Embassy; and Rajeev Kher, Joint Secretary of the Ministry of Environment and Forests signed the official bilateral agreement on 9-5-2000
Ireland	Agency to Agency	Ambassador. Jean Kennedy Smith and Minister Niamh Bhreathnach, Department of Education; at Dublin, 6-12-95
Israel	Agency to Agency	Charge d'Affaires a.i. James Larocco; Yossi Sarid, Ministry of Environment; and Micha Goldman, Ministry of Education, Culture and Sport; Witnessed by VP Gore; at Jerusalem, 3-24-95
Italy	Agency to Agency	DCM James B. Cunningham and Under Secretary of Education Carla Rocchi; at Rome, 1-21-97
Japan	Agency to Agency	<u>Implementing Arrangements</u> : Under Secretary D. James Baker, at Washington, 9-5-00; Yasushi Mitarai for Ministry of Environment (Monbusho) at Tokyo, 9-11-00; and Yasuhiko Okada for Environment Agency at Tokyo, 9-11-00.
	Government to Government	<u>Exchange of Diplomatic Notes</u> : On behalf of the Ambassador of Japan Shunji Yanai and David Sandalow, OES Assistant Secretary; 8-28-00
	Agency to Agency	<u>Implementing Arrangements</u> : Under Secretary D. James Baker, at Washington, 9-15-95; Takayoshi Inoue for Ministry of Education (Monbusho), at Tokyo, 8-31-95; and Takao Onishi for Environment Agency, at Tokyo, 8-30-95.
Jordan	Government to Government	<u>Exchange of Diplomatic Notes</u> : Minister Shotaro Oshima signed for Japanese Ambassador T. Kuriyama and Dave Colson, OES Acting Assistant Secretary, signed for Acting Secretary of State Strobe Talbott; 8-29-95.
	Agency to Agency	Ambassador. Wesley Egan and Minister of Municipal and Rural Affairs and the Environment Dr. Abdul Razzaq Tubeishat; at Amman 10-31-96
	Government to Government	VP Gore and Prime Minister A. Kazhegeldin; at Washington, 3-27-95
Kazakhstan	Government to Government	VP Gore and Prime Minister A. Kazhegeldin; at Washington, 3-27-95
Kenya	Agency to Agency	Ambassador Prudence Bushnell and Kenyan Minister of Foreign Affairs and International Cooperation, Kalonzo Musyoka ; at Nairobi 6-23-97
Kuwait	Government to Government	Ambassador James A. Laroco and Kuwaiti Minister of Education, Dr. Abdul Aziz Al-Ghanim; at Kuwait 4-26-99
Kyrgyzstan	Agency to Agency	Under Secretary of Commerce Dr. James Baker and Charge d'Affaires, Mr. Almas Chukin, on behalf of Minister of Education. Witnessed by Kyrgyz First Lady Mrs. Mairam Akaeva; at Washington, 6-9-95

Latvia	Agency to Agency	Ambassador James Holmes and Latvian Minister of Education and Science, Janis Gaigals; at Riga 1-27-99
Lebanon	Agency to Agency	Ambassador David Satterfield and Lebanon Minister of Environment H.E. Akrem Shehayeb at Beirut, 11-23-98
Lithuania	Agency to Agency	Ambassador John Tefft and Lithuanian Minister of Science and Education Algirdas Monkevicius signed at Lithuania, 10-3-02
Luxembourg	Agency to Agency	Ambassador Clay Constantinou and Minister of Education, Culture and Professional Training, Mrs. Erna Hennicot-Schoepges signed at the Ministry of Education in Luxembourg, 10-10-96
Madagascar	Agency to Agency	Ambassador Vicki J. Huddleston and Minister of Secondary and Primary Education, Simon Jacqui; in Antananarivo, June 11, 1997
Mali	Government to Government	Assistant Secretary of Commerce, Terry Garcia and Foreign Minister Modibo Sidibe signed at GLOBE Headquarters in Washington D.C., 11-19-97
Marshall Islands	Agency to Agency	Acting Foreign Minister and Secretary of Education Christopher Loeak and US Ambassador Plaisted signed at the Marshall Islands Capitol Building, 10-17-96
Mexico	Agency to Agency	Ambassador Jones and Under Secretary for Planning, Secretariat for Environment, Natural Resources and Fisheries, Enrique Provencio signed 11-15-96 at Mexico City, Mexico
Micronesia	Agency to Agency	Charge D'Affaires, Cheryl A. Martin and Secretary for Department of Education, Catalino L. Cantero; at Kolonia, 11-7-97
Moldova	Government to Government	VP Gore and President Snegur; at Washington, 1-30-95
Mongolia	Government to Government	DCM Llewellyn Hedgberth and Undersecretary of the Ministry of Technology, Education and Culture, Mr. Daavasuren Munkhjargal; at Ulaanbatar, 5-6-97
Monaco	Government to Government	His Excellency Bernard Fautrier, Minister for International Cooperation for Environment and Development and GLOBE Program Director Thomas Pyke signed the GLOBE agreement in Monaco on 7-05-2000
Morocco	Agency to Agency	Ambassador. Marc Ginsberg and Minister Rachid Belmokhtar, Ministry of National Education; at Rabat, 3-27-96
Namibia	Agency to Agency	Ambassador George Ward and Minister John Mutorwa, Ministry of Basic Education and Culture; at Windhoek, 10-8-97
Nepal	Agency to Agency	Nepalese Secretary of Education Jaya Ram Giri and U.S. Ambassador Ralph Frank; at Kathmandu, 3-3-00

Netherlands	Government to Government	VP Gore and Prime Minister Willem Kok; at Washington, 2-28-95
New Zealand	Agency to Agency	Ambassador Carol Moseley Braun and New Zealand Minister of Education Trevor Mallard; in New Zealand, 2-29-00
Nigeria	Agency to Agency	Ambassador Howard F. Jeter and Prof. A. Babaloia Borishade, Hon. Minister of Education; in Abuja, 7-15-02
Norway	Government to Government	VP Gore and Prime Minister Gro Brundtland; at Washington, 4-5-95
Pakistan	Agency to Agency	Secretary of State Madeline Albright and Minister for Foreign Affairs, Mr. Gohar Ayub Khan; at Islamabad, 11-18-97
Palau	Agency to Agency	DCM Gerard Pascua and Minister of Education Mr. Kuartei, Koror, 1-30-97
Panama	Agency to Agency	Panamian Minister of Education Doris Rosas de Mata and U.S. Ambassador Simon Ferro; at Panama City, 3-2-00
Paraguay	Agency to Agency	US Ambassador David N. Greenlee, Paraguayan Foreign Minister Juan Esteban Aguirre, Paraguayan Vice Minister of Education Blanca Ovelar de Duarte and Paraguayan Minister-Secretary of the Environment Juan Francisco Facetti attended the October 27, 2000 signing ceremony at the Paraguayan Foreign Ministry in Asuncion
Peru	Agency to Agency	Ambassador Dennis Jett and Director of Peruvian National Environmental Council (CONAM), Mr. Gonzalo Galdos, at Lima, 7-10-97
Philippines	Agency to Agency	Ambassador Thomas Hubbard and Philippine Secretary of Science and Technology, Dr. William G. Padolina; at Manila, 1-14-99
Poland	Agency to Agency	Ambassador Rey; and Deputy Minister of Education, Mirosław Sawicki, at Warsaw, 4-22-97
Portugal	Agency to Agency	Minister of Education, Professor Eduard Marcal Grilo and Minister of the Environment, Professor Elisa Maria Ferreura and Ambassador. Elizabeth Frawley Bagley at Lisbon, 10-23-96
Qatar	Agency to Agency	His Excellency Sheikha Al-Mahmoud, Undersecretary of Education and Higher Education and U.S. Ambassador Elizabeth McKune signed the official bilateral agreement in Doha on 9-28-2000
Romania	Agency to Agency	Under Secretary of Commerce Dr. James Baker, at Washington, 5-22-95; and State Secretary for Education Romulus Pop, Ministry of Education, at Bucharest; 4-11-95

Russia	Government to Government	VP Gore and Prime Minister Chernomyrdin; at Moscow, 12-16-94
Saudi Arabia	Government to Government,	Saudi Minister of Education, Dr. Mohammad A. Rasheed, and the U.S. Assistant Secretary of State for Educational and Cultural Affairs, Patricia de Stacy Harrison; at Washington, D.C., 9-30-02
Senegal	Agency to Agency	Charge d'Affaires, a.i. Robert J. Kott; Abdoulaye Bathily for Ministry of the Environment and Protection of Nature; and Andre Sonko for National Ministry of Education; at Dakar, 3-28-95
South Africa	Government to Government	VP Al Gore and South African Deputy President Thabo Mbeki; at Cape Town, 2-17-97
South Korea	Agency to Agency	Ambassador. James Laney and Education Minister Kim Sook-he; at Seoul, 4-21-95
Spain	Agency to Agency	Charge d'Affaires, A.I. Lawrence G. Rossin and Minister of Education, Esperanza Aguirre; at Madrid, 5-5-98
Sri Lanka	Agency to Agency	Ambassador Donnelly and Chairman of the Central Environment Authority, T.K. Dassanayake, at Colombo, 12-20-99
Suriname	Agency to Agency	Ambassador. Dennis Hays and Minister of Education, Narainpersad Mahadewsingh, at Paramaribo, 12-24-97
Sweden	Agency to Agency	Ambassador. Thomas L. Siebert and Ulf P. Lundgren, Director General for National Agency for Education; at Stockholm, 8-23-95
Switzerland	Agency to Agency	Ambassador Madeline Kunin and Federal Councilor Moritw Leuenberger; at Bern, 4-22-98
Tanzania	Agency to Agency	Ambassador J Brady Anderson and Minister of Education and Culture, Prof. Juma Athumani Kapuya; at Dar Es Salaam, 4-1-97
Thailand	Government to Government	Ambassador Richard E. Hecklinger and Deputy Prime Minister Trairong Suwankiri; at Bangkok, 10-6-99
Trinidad & Tobago	Agency to Agency	Ambassador. Brian J. Donnelly and Minister of Education Dr. Adesh Nanan; at Port of Spain; 7-16-96
Tunisia	Agency to Agency	Under Secretary of Commerce Dr. James Baker and Mrs. Amel Benzarti, Director of International Cooperation, Ministry of Environment; at Washington, 7-27-95
Turkey	Government to Government	Ambassador. Marc Grossman and Nevzat Ayaz, Minister of National Education; at Ankara, 5-5-95
Uganda	Government to Government	Charge d' Affaires Michael McKinley and Minister of Education, Apolo Nsibambi, at Kampala, 11-26-1998
Ukraine	Agency to Agency	Ambassador Steven Pifer and Ukrainian Minister of Education, Valentyn Zaychuk; at Slavutych, 5-27-99

UAE	Agency to Agency	Ambassador Theodore H. Kattouf and Minister of Health and Chairman of the Environmental Agency, Abdul Rahman Al Midfaa, at Abu Dhabi, 6-6-99
United Kingdom	Agency to Agency	Under Secretary of State for Global Affairs Timothy E. Wirth and British Environment Secretary John Gummer; at New York City; 5-1-96
Uruguay	Agency to Agency	Ambassador. Thomas J. Dodd and Minister Juan Antonio Chiruchi, Ministry of Housing, Land Use Planning, and the Environment; at Montevideo, 4-21-95

GLOBE has in force a few additional agreements that are international in scope. They are listed below.

GLOBE Joint Project Partners
(Other than U.S. partnerships)

Institute of Electrical and Electronics Engineers (agreement date: 11-5-95, no expiration date noted)

America-Israel Friendship League (agreement date: 2-28-95, no expiration date noted)

UNHCR (United National High Commissioner for Refugees) (Agreement dates were 5-17-96 through 5-17-98, renewed an additional 5 years on 10/4/99)

UNEP (United Nations Environment Programme) (6-18-99 through 6-18-04)

KidsGLOBE (1-5-98 through 1-5-03)

Appendix F

GLOBE US Partner Agreements

GLOBE has entered into joint project agreements with a variety of US governmental and not-for-profit organizations through exchanges of letters. The generic form of these letters to date is as given below. NASA has assumed responsibility for these agreements from NOAA and will transfer responsibility for them to the selected Area 2 organization as stated in the body of this CAN. The generic letters envision a partnership with an organization that intends to recruit, train, and provide follow-up support to teachers. This basic form was modified for agreements with other types of organizations or those proposing a partnership with a different purpose.

-----beginning of generic agreement letter texts-----
[unsolicited proposal letter from a potential US Partner]

Director
The GLOBE Program
1800 G Street NW, Suite 800
Washington, DC 20006

Dear _____:

I would like to propose that the GLOBE Program consider a partnership with our organization, We would like to work with you to ensure that schools in our immediate service area have the opportunity to participate in the GLOBE Program and reap the benefits of enhancing students' environmental awareness and contributing to the scientific understanding of the Earth's environment.

Partnership Goals

Specifically, we believe that GLOBE fits in with our broad organizational goals by..... We have also identified several goals for our GLOBE partnership which are to (list or highlight several of your partnership's goals for implementation of GLOBE).....

Service Area

We plan on working with schools and teachers primarily in (e.g., City or County), in (e.g., State or Region). Our main thrust will be working with students in grades.....

We propose to undertake an ongoing recruitment effort for schools in our area to join the GLOBE Program. Also, recognizing that each GLOBE school requires a trained GLOBE teacher, we would propose to conduct GLOBE teacher training workshops for teachers from the schools we recruit, on at least an annual basis, or more frequently as necessary to satisfy demand. Upon notification that our partnership with GLOBE has been established, we will work with GLOBE staff to more fully develop our partnership goals and to identify our team of trainers.

After GLOBE schools are recruited and GLOBE teachers are trained, we would propose to develop ongoing mentorship relationships so as to maintain quality in program implementation and data collection.

In order to accomplish these objectives, we have established (are working to establish) relationships with (e.g., school districts, universities, etc.).

Sincerely,
Potential Partner Official

[GLOBE response to a potential US Partner proposal]

Dear _____:

Thank you for your letter proposing collaboration with the GLOBE Program. We would be pleased to work with you as you propose to expand the GLOBE Program throughout your area. We are pleased that you wish to provide the opportunity for students in your area to participate in GLOBE environmental science and education activities in ways that will be educationally stimulating and scientifically productive. We are also pleased that you wish to develop a teacher training program to create a cadre of committed and effective GLOBE teachers in your area, thus permitting their schools' active participation in this meaningful program.

As a hands-on, school-based, international environmental science and education program, GLOBE's mission is to increase environmental awareness throughout the world, to contribute to scientific understanding of the global environment and to support improved achievement in science and mathematics education. Since the GLOBE Program was introduced in April 1994, almost 7000 schools in over 80 countries throughout the world have joined the program. And these numbers are growing continually. GLOBE provides the opportunity for each participating student to communicate with world-class scientists and other GLOBE students all around the world, thus allowing them all to collaborate in the study of the environment.

We would like to accept your offer of collaboration between your organization and the GLOBE Program, and we propose that our collaboration include the following activities:

* **Training of Your GLOBE Trainers.** We would provide training to your training team so that you could train GLOBE teachers. To this end, we would invite you to the earliest possible GLOBE train-the-trainers workshop at which, over a period of approximately five days, we would train your trainers. Our training team would be comprised of a facilitator, one or two GLOBE scientists and a computer/communications systems expert. Your team of trainers should represent expertise in science, education and technology, consistent with the diverse elements of the GLOBE Program that need to be incorporated in a GLOBE training program. Also present at the training workshop should be the person who will manage your GLOBE project. (We have found that it is extremely helpful if at least one member of your team is a teacher who has already received GLOBE teacher training and had experience in implementing the program.)

* **Training of GLOBE Schools.** Upon their return, your trainers would design and implement

GLOBE training for at least one teacher, the GLOBE Lead Teacher, for those interested schools in your area that you have identified and recruited. Your training workshops would begin within six months after you receive training from us, and would be conducted on at least an annual basis, or more frequently as necessary to satisfy demand.

- * GLOBE Educational Materials. We would provide GLOBE educational materials to your trainers, and also to all participants in GLOBE teacher training workshops that you conduct, just as we provide such educational materials to all other GLOBE teachers in training.

- * Registration of GLOBE Schools. We would register the schools of the teachers whom you have trained as GLOBE schools. As part of the registration process, we would issue a GLOBE School ID to each school, thus enabling it to report GLOBE data and to communicate with other GLOBE schools via GLOBEMail. All your GLOBE schools trained and registered in this manner would have all of the responsibilities and privileges of all other GLOBE schools.

- * Information Exchange. We would make available to you general information about the status of the GLOBE Program. We would also ask that you keep us informed about your activities and your progress related to the GLOBE Program.

- * Evaluation. Evaluation is an important element in our management and continual improvement of the GLOBE Program. We would ask that you assist us in this process by providing information as requested by our evaluators. We would also appreciate any independent evaluations of the program that you might conduct.

Our cooperation would proceed with the following understandings:

- * GLOBE and your organization would each release information about the GLOBE Program and their GLOBE activities, as they deem appropriate without prior consultation.

- * Your organization may use US Government trademarks associated with the GLOBE Program provided that such use is consistent with the enclosed trademark license.

- * GLOBE and your organization would each bear the costs of conducting their respective activities under this agreement; no exchange of funds is envisioned. Obligations of GLOBE and your organization pursuant to this agreement would be subject to their respective funding procedures and the availability of appropriated funds and/or other resources.

It is necessary for us to note that this relationship between the GLOBE Program and your organization cannot be an exclusive one. We expect that, over time, we may enter in relationships with a variety of organizations interested in recruiting GLOBE schools, providing training to GLOBE teachers and mentoring GLOBE students.

Your original proposal to us, this letter, and your response to this letter confirming your acceptance of its contents will constitute our agreement. Our cooperation would begin upon the date of your response and continue for three years. Our agreement may be revised or extended upon our mutual agreement and may be terminated by either party on written notice. I look

forward to receiving your reply.

We are very excited about the prospects of working closely with you. Expanding participation in the GLOBE Program is a very high priority to us -- both to enhance the environmental awareness of individuals throughout the world and also to facilitate the collection of environmental data that will improve our understanding of the Earth.

Sincerely,
GLOBE Director

-----end of generic agreement letter texts-----

Current GLOBE US Partner joint endeavor agreements.

In the following table, only those agreements that have not yet expired are listed. GLOBE has written to those organizations whose agreements have expired or that will soon expire. Some of them may extend their partnership agreements with GLOBE. Also, GLOBE is continuing to enter into partnership agreements. In some cases the begin and end dates are not given. In these cases, Area 2 offerors should assume that there is no expiration date.

Partner Name	State	Begin Date	End Date
Spring Branch Independent School District	TX	1-Oct-97	1-Oct-02
University of North Carolina at Wilmington	NC	15-Oct-99	15-Oct-02
Environmental Perspectives International	CA	16-Oct-97	16-Oct-02
Kansas State University	KS	22-Oct-97	22-Oct-02
Southern University and A&M College	LA	22-Oct-99	22-Oct-02
Tulsa Public Schools	OK	22-Oct-99	22-Oct-02
Everett Area School District	PA	29-Oct-99	29-Oct-02
Stroud Water Research Center	PA	17-Nov-97	17-Nov-02
Indian Prairie Community Unit School District #204	IL	23-Nov-99	23-Nov-02
University of Mary	ND	2-Dec-97	2-Dec-02
The Center of Excellence for Science and Mathematics	TN	3-Dec-99	3-Dec-02
University of Montana	MT	11-Dec-97	11-Dec-02
Georgia Tech	GA	12-Dec-97	12-Dec-02
Capital Region Board of Cooperative Educational Services	NY	15-Dec-97	15-Dec-02
Wright State University	OH	16-Dec-97	16-Dec-02
Fulton-Montgomery Education Initiative Consortium	NY	23-Dec-97	23-Dec-02
Stark County Education Service Center	OH	23-Dec-97	23-Dec-02
University of Miami	FL	8-Jan-98	8-Jan-03
Denton Independent School District	TX	16-Jan-98	16-Jan-03
Penn State University-Great Valley	PA	19-Jan-00	19-Jan-03
Bridgewater State College	MA	3-Feb-00	3-Feb-03
Aquinas College	MI	16-Feb-98	16-Feb-03
Dutchess County Board of Cooperative Educational Services	NY	19-Feb-98	19-Feb-03
Mountain Top Arboretum	NY	22-Feb-98	22-Feb-03
Broome-Tioga Board of Cooperative Educational Services	NY	25-Feb-98	25-Feb-03

Monroe #1 Board of Cooperative Educational Services	NY	25-Feb-98	25-Feb-03
Warren Wilson College	NC	2-Mar-98	2-Mar-03
The Iowa Academy of Science	IA	3-Mar-98	3-Mar-03
North Carolina School of Science and Mathematics	NC	7-Mar-00	7-Mar-03
The University of North Texas	TX	7-Mar-00	7-Mar-03
University of New Hampshire	NH	16-Mar-98	16-Mar-03
University of Maryland Baltimore County	MD	17-Mar-00	17-Mar-03
Instructional Technology Services of Central Ohio, Inc.	OH	21-Mar-00	21-Mar-03
University of Texas at El Paso	TX	30-Mar-98	30-Mar-03
University of Arizona	AZ	7-Apr-98	7-Apr-03
Spencer-East Brookfield Regional School District	MA	7-Apr-00	7-Apr-03
North Carolina A&T State University	NC	24-Apr-00	24-Apr-03
Bowling Green State University	OH	24-Apr-00	24-Apr-03
Grand Valley State University	MI	1-May-98	1-May-03
Wheeling Jesuit University	WV	1-May-98	1-May-03
Rocky Mountain NASA Space Grant Consortium	UT	14-May-98	14-May-03
Fayetteville State University	NC	18-May-00	18-May-03
Ohio Space Grant Consortium	OH	14-Jun-98	14-Jun-03
Cuyahoga Valley Environmental Education Center	OH	14-Jun-98	14-Jun-03
Morehead State University	KY	15-Jun-99	15-Jun-03
Anne Springs Close Greenway/North Central Math & Science Hub	SC	30-Jun-00	30-Jun-03
Institute of Marine Science	WA	8-Jul-98	8-Jul-03
Juniata College	PA	24-Jul-00	24-Jul-03
Oklahoma State University	OK	29-Jul-98	29-Jul-03
Hamline University	MN	31-Jul-98	31-Jul-03
Center for Science, Mathematics, and Technology Education	NC	1-Aug-00	1-Aug-03
Our Lady of the Lake University	TX	7-Aug-98	7-Aug-03
Howard University	DC	21-Sep-00	21-Sep-03
Norfolk State University	VA	21-Sep-00	21-Sep-03
Florida State University	FL	2-Oct-00	2-Oct-03
Francis Howell School District	MO	10-Oct-00	10-Oct-03
Mississippi Department of Education	MS	12-Oct-98	12-Oct-03
Queens College	NY	18-Oct-00	18-Oct-03
The Catamount Institute	CO	23-Oct-00	23-Oct-03
Eureka Communities-Detroit	MI	23-Oct-00	23-Oct-03
Governor's School-University of Virginia's College at Wise	VA	7-Nov-00	7-Nov-03
College of Natural Resources at Virginia Tech.	VA	16-Nov-00	16-Nov-03
Hemlock Overlook Center for Outdoor Education/George Mason University	VA	21-Nov-00	21-Nov-03
State University of West Georgia	GA	16-Jan-01	16-Jan-04
James Madison University	VA	23-Jan-01	23-Jan-04
Ball State University	IN	20-Feb-01	20-Feb-04
St. Lawrence Valley Teachers' Learning Center	NY	7-Mar-01	7-Mar-04
Onondaga-Cortland-Madison Regional Board of Cooperative Educ Services	NY	7-Mar-01	7-Mar-04
Prude Ranch Continuing Education Programs, Inc.	TX	8-Mar-01	8-Mar-04

WGTE Public Broadcasting	OH	16-Mar-01	16-Mar-04
Education Service Center Region 12	TX	19-Mar-01	19-Mar-04
Southwestern Ohio Instructional Technology Association (SOITA)	OH	28-Mar-01	28-Mar-04
WCET Education and Technology	OH	6-Apr-01	6-Apr-04
Tennessee State University	TN	9-Apr-01	9-Apr-04
US Bureau of Land Management/Campbell Creek Science Center	AK	25-Apr-01	25-Apr-04
Dine College-Shiprock Campus	NM	25-Apr-01	25-Apr-04
Blue Ice International	WV	30-Apr-99	30-Apr-04
WVIZ/PBS	OH	1-May-01	1-May-04
Virginia Museum of Natural History	VA	15-May-01	15-May-04
Biological & Environmental Sciences Department/UT-Chattanooga	TN	22-May-01	22-May-04
Crownpoint Institute of Technology	NM	31-May-01	31-May-04
Shielding Tree Nature Center	MI	5-Jul-01	5-Jul-04
Alamo Community College District	TX	6-Jul-01	6-Jul-04
Cattaraugus/Allegany BOCES	NY	16-Jul-01	16-Jul-04
Challenger Learning Center of Alaska	AK	27-Aug-01	27-Aug-04
Fort Belknap College	MT	27-Aug-01	27-Aug-04
Stone Child College	MT	27-Aug-01	27-Aug-04
Salish Kootenai College	MT	27-Aug-01	27-Aug-04
Dull Knife Memorial College	MT	27-Aug-01	27-Aug-04
Wesley College	DE	9-Sep-01	9-Sep-04
Sonoma County Office of Education	CA	9-Oct-01	9-Oct-04
Team Ag Ed	IN	26-Oct-01	26-Oct-04
Southern University at New Orleans	LA	5-Nov-01	5-Nov-04
Florida A&M University	FL	20-Nov-01	20-Nov-04
Center for Environmental Education at Middle Tennessee State University	TN	4-Jan-02	4-Jan-05
State University of New York at Fredonia	NY	7-Jan-02	7-Jan-05
Sitting Bull College	ND	8-Jan-02	8-Jan-05
Highline Community College	WA	9-Jan-02	9-Jan-05
Bay Mills Community College	MI	16-Jan-02	16-Jan-05
University of Toledo	OH	23-Jan-02	23-Jan-05
Keweenaw Bay Ojibwa Community College	MI	28-Jan-02	28-Jan-05
St. Croix Foundation/Virgin Islands Department of Labor	VI	12-Feb-02	12-Feb-05
NASA Network Resources and Training Site at Elizabeth City State University	NC	13-Feb-02	13-Feb-05
Hartnell College	CA	1-Dec-01	1-Mar-05
Bellarmine University and the Louisville Nature Center	KY	13-Mar-02	13-Mar-05
Towson University	MD	22-Mar-02	22-Mar-05
Red Rock Canyon National Conservation Area	NV	22-Mar-02	22-Mar-05
California University of Pennsylvania	PA	28-Mar-02	28-Mar-05
Theodore Jamerson School District	ND	29-Mar-02	29-Mar-05
Bismarck Public School District	ND	29-Mar-02	29-Mar-05
New Braunfels Independent School District	TX	11-Apr-02	11-Apr-05
Colorado State University	CO	18-Apr-02	18-Apr-05
Jackson State University	MS	12-Jun-02	12-Jun-05

Mathematics, Engineering, Science Achievement (MESA)	CA	15-Jun-02	15-Jun-05
Chatham County Schools	NC	30-Jun-02	30-Jun-05
Penn State University - University Park	PA	30-Jun-02	30-Jun-05
Water Ways	SD	30-Jun-02	30-Jun-05
Texas A & M University - Corpus Christi	TX	10-Jul-02	10-Jul-05
University of Minnesota	MN	15-Jul-02	15-Jul-05
Society for Amateur Scientists	RI	8-Aug-02	8-Aug-05
Hilton Pond Center for Piedmont Natural History	SC	8-Aug-02	8-Aug-05
Boise State University	ID	15-Nov-96	15-Nov-05
University of Arkansas at Little Rock	AR		
NASA Marshall Space Flight Center	AL	16-Apr-97	no expiration
NASA Ames Research Center	CA	16-Apr-97	no expiration
NASA Goddard Space Flight Center	MD	16-Apr-97	no expiration
NASA John C. Stennis Space Center	MS	3-Apr-97	no expiration
Indiana Business Modernization and Technology Corporation	IN		
Seventh Generation	OH		
West Chester University	PA		
Education Service Center Region II	TX		

APPENDIX G
INSTRUCTIONS FOR RESPONDING TO
NASA COOPERATIVE AGREEMENT NOTICE

CAN-02-OES-02
The GLOBE Program

General

- 1) Proposals received in response to this Cooperative Agreement Notice (CAN) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to a CAN to be used as the basis of a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.
- 2) A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.
- 3) CANs contain programmatic information and certain requirements that apply only to proposals prepared in response to that particular notice. These instructions contain the general proposal preparation information that applies to responses to all CANs.
- 4) NASA does not have mandatory forms or formats for responses to CANs; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.
- 5) To be considered for award, a submission must, at a minimum, provide a plan for GLOBE implementation for five (5) years, a detailed proposal for how the transition from the current GLOBE organizations to the new organization is to be accomplished between award of a cooperative agreement and September 30, 2003, contain sufficient technical and cost information to permit a meaningful evaluation; and be signed by an official authorized to legally bind the submitting organization(s).

Cost Sharing/Institutional Commitment Requirements

Resource sharing is required for all for-profit private organizations that are expected to receive compensating benefits through the development or enhancement of a product or service that may result from their work funded by NASA. When a commercial organization is part of a consortium, the requirement for resource sharing is based upon the amount of Government funding applied to that organization's efforts, not the entire value of the Cooperative Agreement. Accordingly, proposals must be signed by an official authorized to commit the offeror to any

cost sharing commitment proposed and include a positive statement of confirmation regarding this cost sharing commitment.

Withdrawal

The proposer may withdraw proposal(s) at any time before award. Offerors are requested to notify NASA immediately of their withdrawal.

Selection for Award

When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact Dr. Dixon M. Butler, The GLOBE Program, 1800 G St, N.W., Suite 800, Washington, D.C. 20006; phone (202) 501-3200; E-Mail, [who](#) will arrange a debriefing.

When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

Cancellation of CAN

NASA reserves the right to make no awards under this CAN and to cancel this CAN. NASA assumes no liability for canceling the CAN or for anyone's failure to receive actual notice of cancellation.

APPENDIX H

SYS-EYFUS GENERATED FORMS

The following appendices are sample forms, which will be generated through the electronic proposal submission process. You will NOT need to reprint them from the hard copy of this solicitation; rather, they are provided as sample copies for your convenience.

H-1	Proposal Cover Pages (including electronic entry)
H-2	Assurances and Certifications
H-3	Budget Request Summary and Instructions

Appendix H-1

Required Proposal Cover Pages

Two proposal cover pages are required as part of the proposal. The first is a **hard copy** (see below for instructions on how to acquire the hard copy of the proposal cover page from the online system) which must be signed by the Principal Investigator and an official by title of the investigator's organization who is authorized to commit the organization. This authorizing signature also certifies that the proposing institution has read and is in compliance with the required certifications printed in full, therefore, these certifications do not need to be submitted separately. This page will not be counted against the page limit of the proposal.

The second proposal cover page must be submitted **electronically** to the SYS-EYFUS Web site located at <http://proposals.hq.nasa.gov/>. If the proposer has submitted an electronic Notice of Intent (Appendix E) to SYS-EYFUS, the same user UserID and password can be used to complete the electronic proposal cover page. If the proposer obtained a User ID and password in the process of submitting a proposal for a previous research opportunity announcement, the same user UserID and password can be used to complete the electronic proposal cover page in response to this research opportunity announcement. Be sure to click on "Edit Personal Information" if any of your correspondence information in the SYS-EYFUS is not current.

If you do not have a SYS-EYFUS UserID or password, you may obtain one electronically by going to <http://proposals.hq.nasa.gov> and performing the following steps:

- Click the hyperlink for **new user** which will take you to the Personal Information Search Page.
- Enter your first and last name. SYS-EYFUS will **search** for your record information in the SYS-EYFUS database.
- Confirm your personal information by **choosing** the record displayed.
- Select **continue**, and a User ID and password will be e-mailed to you.

Once you receive your User ID and Password, **login** to the SYS-EYFUS Web site and follow the instructions for **New Proposal Cover Page**.

Proposers without access to the Web or who experience difficulty in using this site may contact the Help Desk at proposals@hq.nasa.gov (or call 202.479.9376) for assistance. After you have submitted your notice of intent or proposal cover page electronically, if you are unsure if it has been successfully submitted, do not re-submit. Please call the Help Desk. They will be able to promptly tell you if your submission has been received. Please note that submission of the electronic cover page does not satisfy the deadline for proposal submission.



Date: __/__/____

Name of Submitting
Institution: _____Congressional
District: _____

Proposal Title: _____

Name of Submitting
Institution: _____

Congressional District: _____

Certification of Compliance with Applicable Executive Orders and US Code

By submitting the proposal identified in this *Cover Sheet/Proposal Summary* in response to this Research Announcement, the Authorizing Official of the proposing institution (or the individual proposer if there is no proposing institution) as identified below:

- certifies that the statements made in this proposal are true and complete to the best of his/her knowledge;
- agrees to accept the obligations to comply with NASA award terms and conditions if an award is made as a result of this proposal; and
- confirms compliance with all provisions, rules, and stipulations set forth in the two Certifications contained in this NRA [namely, (i) *Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs*, and (ii) *Certifications, Disclosures, And Assurances Regarding Lobbying and Debarment & Suspension*].

Willful provision of false information in this proposal and/or its supporting documents, or in reports required under an ensuing award, is a criminal offense (U.S. Code, Title 18, Section 1001).

NASA PROCEDURE FOR HANDLING PROPOSALS

This proposal shall be used and disclosed for evaluation purposes only, and a copy of this Government notice shall be applied to any reproduction or abstract thereof. Any authorized restrictive notices that the submitter places on this proposal shall also be strictly complied with. Disclosure of this proposal for any reason outside the Government evaluation purposes shall be made only to the extent authorized by the Government.

Principal Investigator Name:		Authorized Institutional Official Name:		
Organization:		Organization:		
Department:		Department:		
Mailing Address:		Mailing Address:		
City, State Zip:		City, State Zip:		
Telephone Number:		Telephone Number:		
Fax Number:		Fax Number:		
Email Address:		Email Address:		
Principal Investigator Signature:	_____	Authorized Institutional Official Signature:	_____	
Date:	_____	Date:	_____	
Co-Investigator:				
Name	Telephone	Email	Institution	Address

Appendix H-2
Assurance of Compliance with the NASA Regulations Pursuant to Nondiscrimination in
Federally Assisted Programs

The (*Institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant "*) hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1972 (20 U.S.C. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and the Age Discrimination Act of 1975 (42 U.S.C. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognizes and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear on the Proposal Cover Sheet above are authorized to sign on behalf of the Applicant.

NASA FORM 1206 JUN 2001 PREVIOUS EDITIONS ARE OBSOLETE

CERTIFICATIONS, DISCLOSURES, AND ASSURANCES REGARDING LOBBYING AND DEBARMENT & SUSPENSION

1. LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 14 CFR Part 1271, as defined at 14 CFR Subparts 1271.110 and 1260.117, with each submission that initiates agency consideration of such applicant for award of a Federal contract, grant, or cooperative agreement exceeding \$ 100,000, the applicant must **certify** that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit a Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

2. GOVERNMENTWIDE DEBARMENT AND SUSPENSION

As required by Executive Order 12549, and implemented at 14 CFR 1260.510, for prospective participants in primary covered transactions, as defined at 14 CFR Subparts 1265.510 and 1260.117—

(1) The prospective primary participant **certifies** to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

APPENDIX H-3

BUDGET SUMMARY

For period from _____ to _____

- Provide a complete Budget Summary for year one and separate estimated for each subsequent year.
- Enter the proposed estimated costs in Column A (Columns B & C for NASA use only).
- Provide as attachments detailed computations of all estimates in each cost category with narratives as required to fully explain each proposed cost. See *Instructions For Budget Summary* on following page for details.

		<u> NASA USE ONLY </u>	
	A	B	C
1. <u>Direct Labor</u> (salaries, wages, and fringe benefits)	_____	_____	_____
2. <u>Other Direct Costs</u> :			
a. Subcontracts	_____	_____	_____
b. Consultants	_____	_____	_____
c. Equipment	_____	_____	_____
d. Supplies	_____	_____	_____
e. Travel	_____	_____	_____
f. Other	_____	_____	_____
3. <u>Indirect Costs*</u>	_____	_____	_____
4. <u>Other Applicable Costs</u>	_____	_____	_____
5. <u>SUBTOTAL--Estimated Costs</u>	_____	_____	_____
6. <u>Less Proposed Cost Sharing</u> (if any)	_____	_____	_____
7. <u>Carryover Funds</u> (if any)			
a. Anticipated amount : _____			
b. Amount used to reduce budget	_____	_____	_____
8. <u>Total Estimated Costs</u>	_____	_____	XXXXXXXX
9. APPROVED BUDGET	XXXXXX	XXXXXXXX	_____

* Facilities and Administrative Costs.

INSTRUCTIONS FOR BUDGET SUMMARY

1. Direct Labor (salaries, wages, and fringe benefits): Attachments should list the number and titles of personnel, amounts of time to be devoted to the grant, and rates of pay.
2. Other Direct Costs:
 - a. Subcontracts: Attachments should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting.
 - b. Consultants: Identify consultants to be used, why they are necessary, the time they will spend on the project, and rates of pay (not to exceed the equivalent of the daily rate for Level IV of the Executive Schedule, exclusive of expenses and indirect costs).
 - c. Equipment: List separately. Explain the need for items costing more than \$5,000. Describe basis for estimated cost. General purpose equipment is not allowable as a direct cost unless specifically approved by the NASA Grant Officer. Any equipment purchase requested to be made as a direct charge under this award must include the equipment description, how it will be used in the conduct of the basic research proposed and why it cannot be purchased with indirect funds.
 - d. Supplies: Provide general categories of needed supplies, the method of acquisition, and the estimated cost.
 - e. Travel: Describe the purpose of the proposed travel in relation to the grant and provide the basis of estimate, including information on destination and number of travelers where known.
 - f. Other: Enter the total of direct costs not covered by 2a through 2e. Attach an itemized list explaining the need for each item and the basis for the estimate.
3. Indirect Costs*: Identify F&A cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. Provide the name, address, and telephone number of the Federal agency official having cognizance. If unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate.
4. Other Applicable Costs: Enter total explaining the need for each item.
5. Subtotal-Estimated Costs: Enter the sum of items 1 through 4.
6. Less Proposed Cost Sharing (if any): Enter any amount proposed. If cost sharing is based on specific cost items, identify each item and amount in an attachment.
7. Carryover Funds (if any): Enter the dollar amount of any funds expected to be available for carryover from the prior budget period. Identify how the funds will be used if they are not used to reduce the budget. NASA officials will decide whether to use all or part of the anticipated carryover to reduce the budget (not applicable to 2nd-year and subsequent-year budgets submitted for award of a multiple year award).
8. Total Estimated Costs: Enter the total after subtracting items 6 and 7b from item 5.

* Facilities and Administrative (F&A) Costs

Appendix I

Government Furnished Equipment (GFE)

The Government will be responsible for providing the Government Furnished Equipment (GFE) to the recipient F.O.B. the recipient's location. These items are currently in use in the implementation of the GLOBE Program. Offerors should indicate in their transition plans which items of equipment, if any, they wish the Government to provide and how and when they envision the transfer being accomplished.

1. The Hardware Inventory for GLOBE HQ is summarized as follows:

Hardware and Software Inventory for GLOBE HQ:

LAN equipment:

Cat 6 cabling

Cisco 2501 Router

Larscom FT1 Multiplexer for T-1

Servers:

Server 1	500mhz P2	768m RAM	80gb HD	WinNT 4.0
Server 2	550mhz P2	768m RAM	80gb HD	WinNT 4.0

Desktop PC's:

System 1	1.7ghz P4	256RAM	40gb HD	Win2K
System 2	850 Mhz P3	128RAM	20gb HD	Win2K
System 3	1.4ghz P4	256RAM	40gb HD	Win2K
System 4	450mhz P2	256RAM	4gb HD	Win2K
System 5	1ghz P4	192RAM	40gb HD	Win2K
System 6	333mhz Cel.	128RAM	4gb HD	Win2K
System 7	450mhz P2	128RAM	4gb HD	Win98
System 8	400mhz P2	128RAM	10gb HD	Win2K
System 9	1.7ghz P4	256RAM	40gb HD	Win2K
System 10	1.0 ghz P3	256RAM	40gb HD	Win2k
System 11	400mhz P2	128RAM	4gb HD	Win2k
System 12	333mhz Cel.	128RAM	4gb HD	Win98
System 13	1.0ghz P3	256RAM	40gb HD	Win2K
System 14	400mhz P2	128RAM	4gb HD	Win95
System 15	750mhz P3	256RAM	20gb HD	Win2K
System 16	1.0ghz P3	256RAM	40gb HD	Win2K
System 17	1.8ghz P4	256RAM	40gb HD	Win2K
System 18	550mhz P3	128RAM	20gb HD	Win98
System 19	333mhz Cel.	128RAM	4gb HD	Win98
System 20	1.5ghz P4	256RAM	40gb HD	Win2K

System 21	1.8ghz P4	256RAM	40gb HD	Win2K
System 22	550mhz P3	128RAM	12gb HD	Win2K
Laptop 1	850mhz P3	256RAM	10gb HD	Win2K
Laptop 2	200mhz Pent.	64RAM	4gb HD	Win95
Laptop 3	400mhz Cel.	128RAM	4gb HD	Win2K

Printers:

Canon 5000 Copier and Network Printer
 Tektronix Phaser 850DX Color Printer
 3 Hewlett Packard HP4 laser printers
 2 Hewlett Packard HP4050N laser printers
 Hewlett Packard HP8000N laser printer
 Hewlett Packard HP6P laser printer

Miscellaneous:

Sony Digital Video Camera
 Sony Digital Still Camera
 Epson 1650 Color Scanner

II. Computer Hardware at Other Locations

This equipment is best described and illustrated by summarizing the GLOBE System Architecture and Components.

Production

The production machines at FSL include one database server and 2 webserver: one for visualizations and one for all other webpages. The FSL servers (production, training, and development) use a NetApp Filer for network shared mass storage. The production machines at GSFC include a database server and a single webserver that serves all webpages including the visualizations. Components at both GSFC and FSL are switch attached rather than hub attached to improve performance. To the user, all of these machines appear to be behind the addresses <http://www.globe.gov/> (for all pages except visualizations) and <http://viz.globe.gov/> (for visualizations). The actual server and database accessed by a given request is determined by the address resolution and routing done by the two Cisco Systems Distributed Directors (DDs). One DD is located at the NASA Ames Research Center (ARC) in Mountain View, California and the other is located at the NOAA Network Operations Center (NNOC) in Suitland, Maryland. The DDs continuously poll the servers for availability and response time, and direct user requests to the server that will provide the best performance. The production machines at DLR in Germany include a database server and a single webserver that serves all webpages including the visualizations. The German servers are accessible via static URL only, and are not part of the

DD system. The German servers are the property of DLR and are not included in this description. The table below gives a summary of the major hardware and software components of each production system.

Location	Function	Platform
FSL	Main web server	Unix
FSL	Visualization server	Unix
FSL	Database server	Unix
FSL	File Server	NetApp Filer
GSFC	Main and Visualization server	Unix
GSFC	Database server	Unix
GSFC	Reference Data Ingest	Unix
ARC	Distributed Director	Cisco 4700M
NNOC	Distributed Director	Cisco 4700M

Training

The training system consists of two machines at FSL: a database and visualization server and webserver that serves all webpages other than visualizations. The training system is accessible via static URL (<http://training.globe.gov/>) only, and is not part of the DD system. The table below gives a summary of the major hardware and software components of training system.

Location	Function	Platform
FSL	Main webserver	Unix
FSL	Viz and Database server	Unix

Development, Test, and Integration Systems

The GLOBE Data System includes the following systems dedicated to development, test, and integration. The table below gives a summary of the major hardware and software components.

Location	Function	Platform
FSL	Main webserver, Development	Unix
FSL	Main webserver, Staging and Test	Unix
FSL	Database Server, Development	Unix
GSFC	Visualization server, Development	Unix
GSFC	Database server, Development	Unix

Help Desk

The Help Desk uses two servers for the operation of its call tracking system, one for Oracle and one for the Remedy call tracking package. The Remedy server is also used for a number of e-mail listserves, including the listserves that support the GLOBE School Collaboration function. Support for the School Collaboration function includes the archiving and exporting of the School Collaboration lists in HTML format.

Location	Function	Platform
ARC	Database Server	Unix, Dual 300MHz Processors, 1 GB RAM, 45 GB RAID5

ARC	Remedy/Mail Server	Unix, Dual 300MHz Processors, 1 GB RAM
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Server Traffic

Main and Visualization Production Webservers

Server traffic numbers include all hits to servers at FSL, GSFC, and DLR. Note that usage tends to track with the school calendar in the Northern Hemisphere, where most GLOBE schools are located. Busiest time of year is from September - May when most schools are in session around the world. The busiest site usage is weekdays between 15:00 UT to 19:00 UT when the majority of the US schools are entering their data. Traffic is noticeably lighter on weekends, holidays, and during the months of June, July, and August.

Server traffic in hits

(each hit represents a single http request for a file, script, or graphic)

Total 2001	Daily Average	Peak Day
~60,000,000	~165,000	~225,000

Production Database Servers

The database performs approximately 198 million queries per year. This includes queries made via the website, direct database query, or queries made as the result of a batch job. The database experiences two computationally intensive times during the day: first between 15:00 UT and 17:00 UT when the visualization reference data is being ingested and then from 00:00 UT to 1:00 UT when the count summary snapshots update with data from the previous day.

Reliability and Availability

The GLOBE Data System using the DDs for load sharing and redundancy provides a very high level of reliability. Since the DD configuration was stabilized in February 2001, there have been no times when the GLOBE webserver was not available at www.globe.gov. Planned database outages where the database is inaccessible for reading or writing for approximately one half hour occur once per week. These outages are automated and scheduled for very low usage periods to minimize impact. Replication sessions, where the database is placed into a read-only mode, comprise approximately 2-3 additional hours per month.